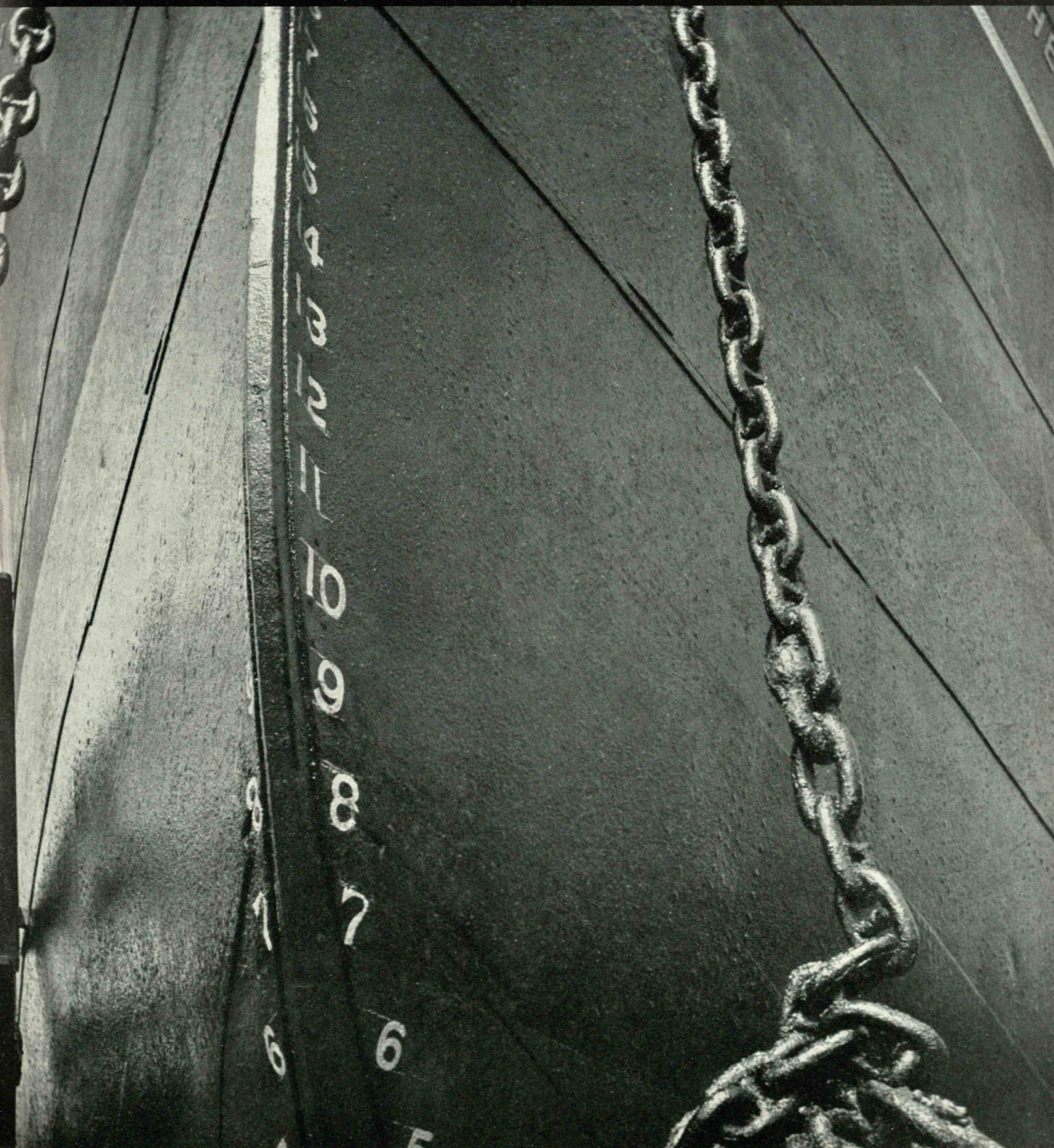


December 1938

TECHNOLOGY REVIEW

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technology review

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THE TABULAR VIEW

AS this issue goes into the mail, the Editors are sending to a geographical cross section of Review readers a questionnaire entitled, "What is the Matter with Our Houses?" Even if one does not answer the questionnaire (we hope you will), the document is stimulating and provocative, and we think you would like to have a copy. So if you do not receive one of these probes and have some pet gripes and strong feelings on home ownership, housing cost and construction, the problem of the back porch, and the removal of fingerprints and spitballs from Junior's wallpaper, drop a card to The Review, and a questionnaire will be sent to you with enthusiastic promptness. The document is designed to elicit information not from specialists but from the layman, whoever he is. (As some wag has paraphrased Gelett Burgess, '87: "I've never seen a layman, I never hope to see one. But this I know that anyhow, I'd rather see than be one.")

AMERICA has pioneered in air transportation since the Wrights first flew at Kitty Hawk. Take for example the high-altitude investigations described by S. PAUL JOHNSTON, '21, on page 71. It might be added as a footnote to Mr. Johnston's article, as Professor John R. Markham, '18, has pointed out to us, that the Boeing Company is building a "Stratoliner." The Curtiss Company has arranged the fuselage structure of a transport that they are building so that its cabin may be put under pressure if they decide to operate at high altitude later on. The Martin Company in Baltimore built an experimental fuselage on which they conducted a number of tests under pressure. The Douglas Aircraft Company has made a very thorough study of the problems involved in the trend toward flight at higher altitudes. There have been a number of publications on this subject, and at the last meeting of the Institute of the Aeronautical Sciences a section was devoted to the reading and discussion of these problems. A concise and thorough summary of the problems is given in an article by W. B. Klemperer in the *Journal of the Aeronautical Sciences* of March, along with other papers on the subject. Mr. Johnston is editor of *Aviation*. ¶ So far as we have been able to discover, the article on page 74 is the first popularized article that has been written on the important technique of powder metallurgy and there have been few scientific papers. JOHN WULFF, the author of The Review's pioneer presentation, is associate professor of physical metallurgy at the Institute, and at the present time he is conducting a seminar on the subject. ¶ KARL T. COMPTON is president of the Institute, and his article on page 77 of this issue is drawn from an address by him before the International Management Congress this fall in Washington. ¶ NORBERT WIENER (page 66) is professor of mathematics at the Institute and a frequent contributor to The Review. ¶ TENNEY L. DAVIS, '13 (page 80), is an editorial associate of The Review and professor of organic chemistry at Technology.

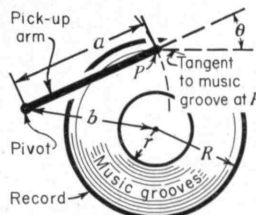
No. 11

Just for Fun!

A CHALLENGE

TO YOUR INGENUITY

RECENTLY, much attention has been given to the "tracking" of phonograph pick-ups on disc records. Formula (1), below, is easy to derive, but can you verify formula (2)?



In the range $R-r$:

- (1) To keep the largest absolute value of θ as small as possible, let

$$a = \sqrt{b^2 - Rr}$$

- (2) To keep the change in θ as small as possible, let

$$a = \sqrt{b^2 + Rr}$$

These formulae may be well known, but we have not seen them elsewhere. They, and many others, were worked out in 1926 to solve this and related phonograph problems.

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MAIL RETURNS

List All Papers Published?

FROM LEICESTER F. HAMILTON, '14:

In looking over the President's Report, under date of October, 1937, and The Review for last month, it occurred to me that it would be advisable to ask the Editors of The Review to consider the following suggestion. I have talked this matter over with some of the members of our Department [Chemistry], and they concur.

The President's Report for October, 1937, gives space to a list of publications by the Institute staff — publications which are numbered consecutively and are credited to the various Departments of the Institute. This is a logical procedure and should be continued. I feel, however, that you might consider the advisability of allotting a certain amount of space each month to the publication of the titles and authors of such scientific articles as are printed as the result of the efforts of the staff. This suggestion is based on the belief that the graduates of the Institute are interested in scientific developments, and while they may be members of one scientific society and receive the journals, they are not necessarily members of all scientific societies; therefore, notice of the publication of many of the articles does not come to their attention. I realize The Review is an alumni journal and as such should be devoted to alumni affairs, but our Alumni are naturally interested in the Institute and its staff, and we should, perhaps, stimulate their interest by affording them the opportunity to know what the staff, or the Institute, is doing along scientific lines.

My suggestion is that a system be evolved whereby the Departments notify you each month of the appearance of these articles in the various scientific journals.

In the President's Report for October, 1937, 340 such articles were listed. On this basis, space will probably be required for about 40 titles in each issue of The Review.

I shall be pleased to assist in any way, if this suggestion is adopted by The Review.

M.I.T., Cambridge, Mass.

The Review is impressed by Professor Hamilton's proposal, will act upon it if Review readers agree. Would you welcome a monthly list of staff papers to supplement the list of alumni papers already published?

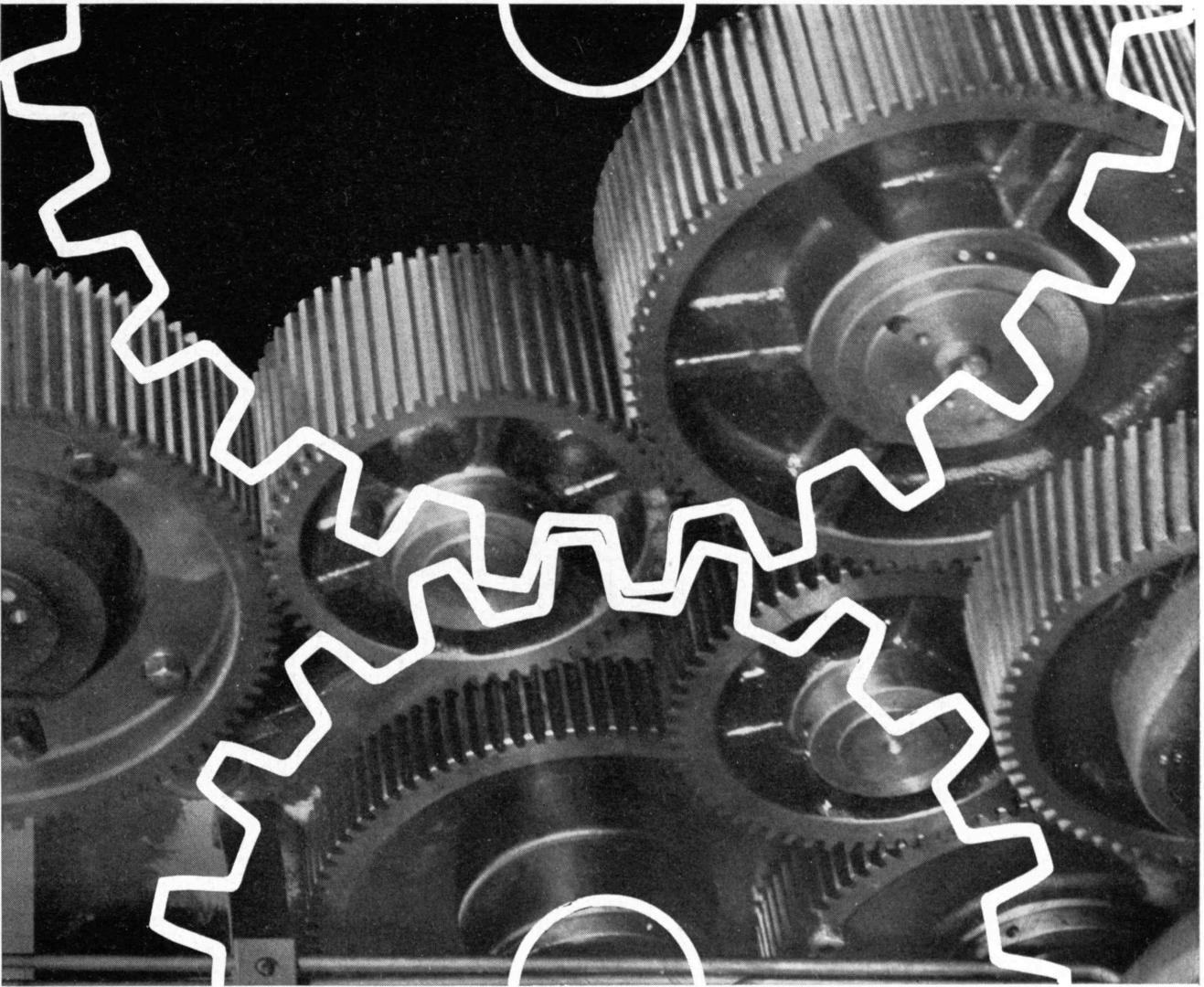
Wild Life at Night

FROM HOWARD CLEAVES:



New Jersey male tree frog in full song in natural location. Enlarged from 35-millimeter motion picture frame. Taken about 9:30 p.m. Illumination supplied by portable generator outfit

. . . I wonder if you have heard of the work I am doing in making motion pictures of wild-life subjects in wilderness places *at night*. So far as I can learn this is a distinct technological advance in the making of motion pictures. Heretofore only still photographs by flashlight (mostly through the use of magnesium powder) have been taken by wild-life photographers. Apparently not even Martin Johnson ever thought of the method I am using, because if he had he certainly would have applied it in Africa. Think what he could have done around those water holes at night. . . . I inclose a glossy print which you are at liberty to publish. . . .
Staten Island, N. Y.



PRECISION GEARS AT LOW COST

THE quality of the gears in a high-grade machine tool determines its performance.

One well-known machine-tool builder finds 0.35% Moly Chrome-Molybdenum iron meeting all requirements for main and intermediate gears in an automatic crankshaft lathe. The iron is wear-resistant enough to assure maintenance of original tooth profiles, thus eliminating tool chatter. Its structure — and therefore its strength — is uniform. There is no trouble from porosity at the bases of the gear teeth. This Chrome-Moly iron also holds down production

costs. It is comparatively inexpensive. It machines easily. And in the case referred to above there has never been any waste from defective castings since it has been adopted.

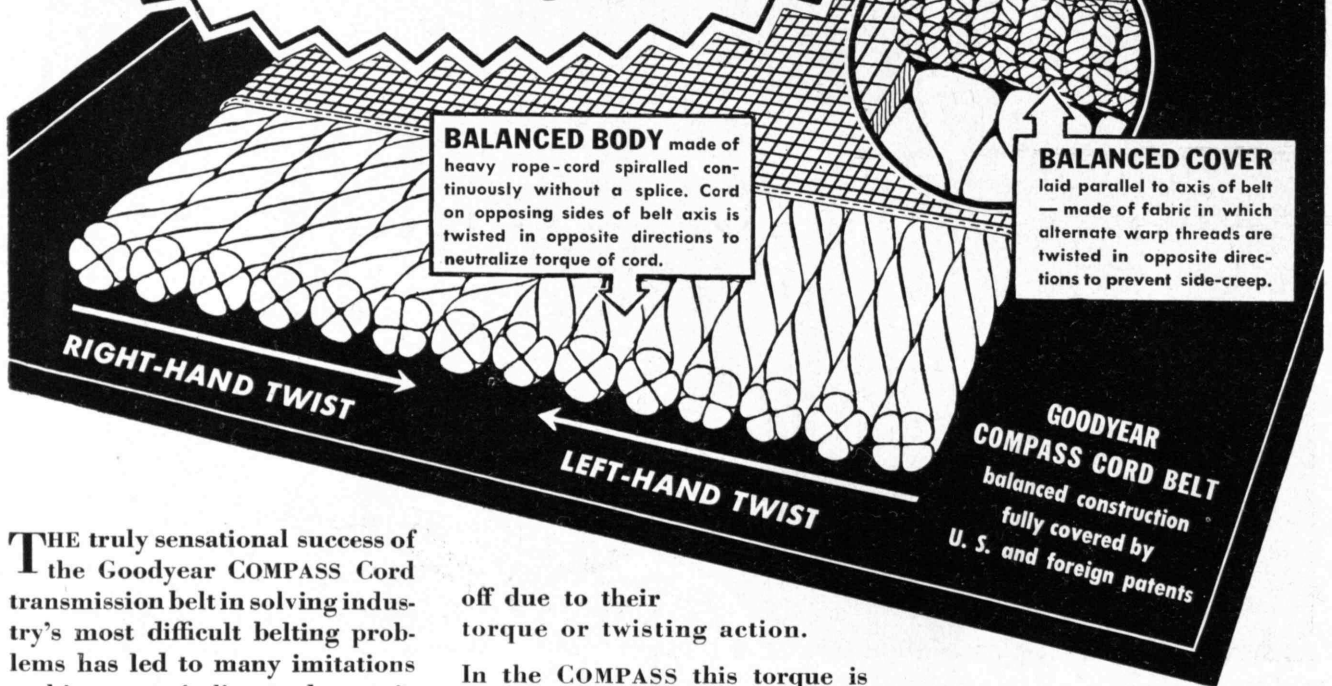
If resistance to wear, uniform strength, plus economical production are vital requisites in the gears, pulleys or similar machine parts you make or use, investigate Moly irons. Our book, "*Molybdenum in Cast Iron*," is free to engineers and production executives. Climax Molybdenum Company, 500 Fifth Avenue, New York City.

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BALANCED BODY made of heavy rope-cord spiralled continuously without a splice. Cord on opposing sides of belt axis is twisted in opposite directions to neutralize torque of cord.

BALANCED COVER laid parallel to axis of belt — made of fabric in which alternate warp threads are twisted in opposite directions to prevent side-creep.

THE truly sensational success of the Goodyear COMPASS Cord transmission belt in solving industry's most difficult belting problems has led to many imitations seeking to capitalize on the magic word "cord."

But what makes the Goodyear COMPASS the truest-running, most nearly stretchless belt on the market—what gives it such exceptionally high flex-life and long wear—is a fully patented method of cord construction no other belt manufacturer can employ!

The Goodyear COMPASS Cord is a modernized flat belt version of the ancient rope drive. With rope drives, as you know, it is necessary to use grooved pulleys to keep the ropes from running

off due to their torque or twisting action.

In the COMPASS this torque is balanced by twisting the ropes, or cords, on opposing sides of the belt axis in opposite directions. Alternate warp threads in the fabric cover are similarly twisted. This patented construction in both body and cover neutralizes any tendency to run off the pulley with an equal pull toward the opposite side, insuring a belt that runs true.

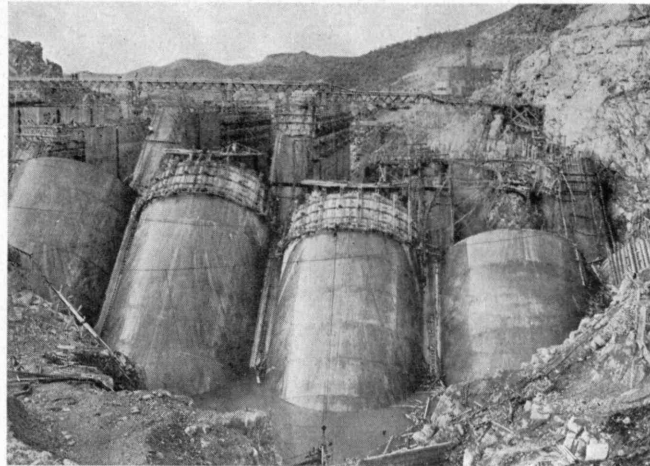
More than this, it permits Goodyear to use larger, stronger cord, eliminating fabric plies entirely in the carcass, and making a thinner, stronger belt with far higher flex-life and longer service-life.

The best proof of this is the remarkable performance of COMPASS belts on industry's hardest drives. From two to five times longer life with practically no stretch is typical. So don't be deceived by the word "cord." The Goodyear COMPASS Cord belt is the only belt in the world with patented balanced cord construction that insures true-running, high flex-life, low stretch and maximum wear. To test COMPASS superiority for yourself, call the nearest Goodyear Mechanical Rubber Goods Distributor.



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THE TECHNOLOGY REVIEW

Title Reg. U. S. Pat. Office

EDITED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

VOL. 41, NO. 2

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DECEMBER, 1938

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IN DRY DOCK**

From a photograph by James N. Doolittle

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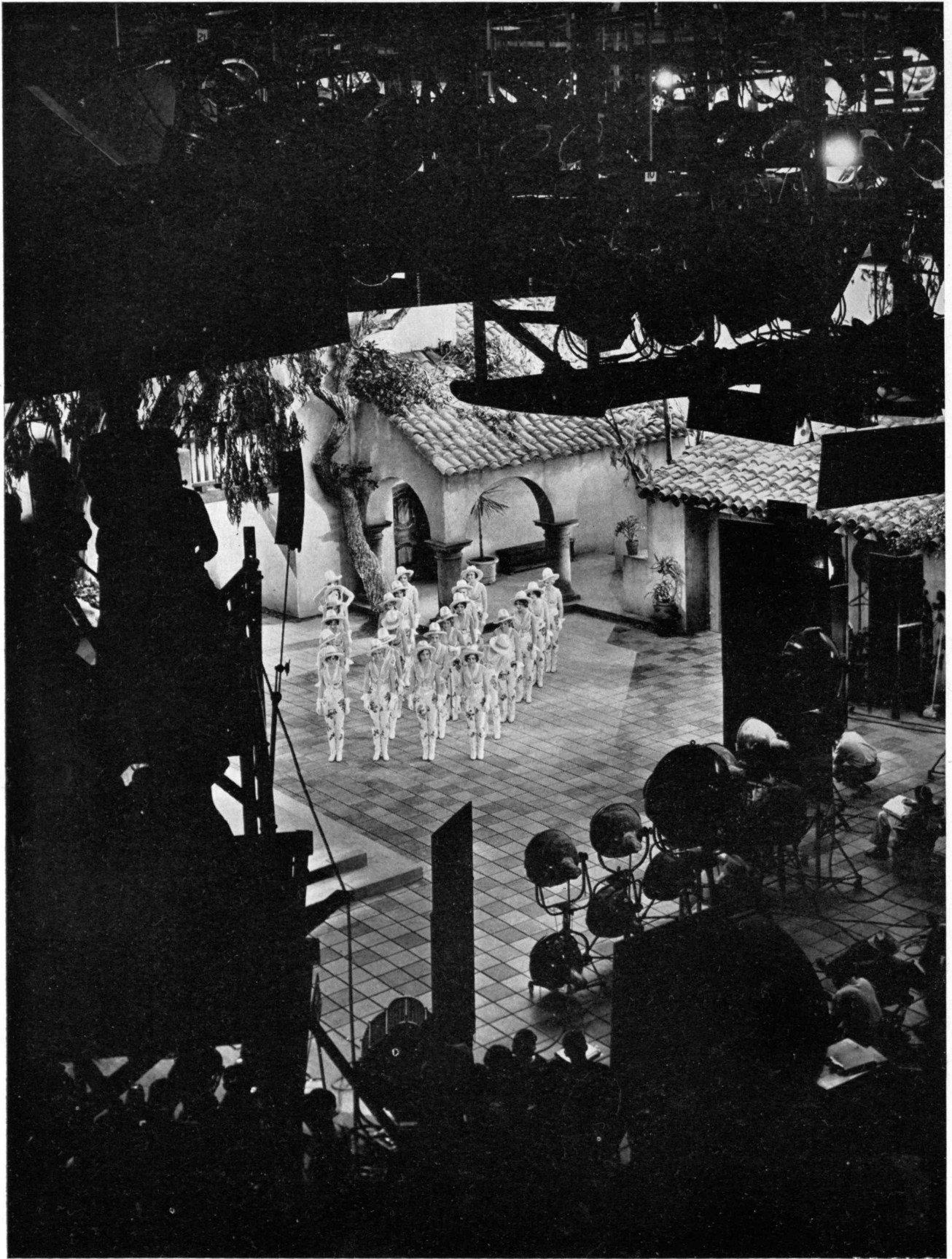
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SUNLIT GLADE IN TECHNOLOGICAL JUNGLE

James N. Doolittle

The complexity that is Hollywood silhouetted against the simplicity that is its product

THE TECHNOLOGY REVIEW

Vol. 41, No. 2



December, 1938

The Trend of Affairs

Hello!

WE said a "hello" and a "What hath God wrought!" over one of the new telephones the other day, and it required a bit of subsequent investigation to find out why the instrument seemed to "talk" differently. The answer is that you no longer hear your own voice muttering in your own receiver as loudly as in the old instruments. "Anti-sidetone" it's called, and the phone is sleekly and pawkily contrived to reduce the sound level reproduced in your receiver from what you are saying into your own transmitter. This not only reduces the level of extraneous room noises (sidetones) in your receiver but induces you subconsciously to speak a little louder for the benefit of your listener.

The new combined set has its own bell in the base of the instrument and a plastic molded handset of new and economical design with quickly removable transmitter and receiver units. Working through the improved anti-sidetone circuit, these instruments give greatly improved transmission performance. They are also less susceptible to noise caused by power transmission systems on certain types of party lines.

The new instruments also have much quieter dials, a fact which the telephone user will overlook unless he has the opportunity to make a direct comparison. Incidentally, dials used by telephone operators in private branch exchanges operate much faster than those on the instruments of the subscribers. The operator one reaches by dialing O on a city exchange often completes calls by pushing buttons on a keyboard like that of an adding machine. These methods make possible the quick completion of calls.

There are other new tricks in dialing: To the already astonishing capabilities of the automatic machine switchboards, many of which are now being

equipped with a new and economical type of switch called the crossbar switch, has been added a new switching operation. Known in telephone parlance as "toll diversion," this system makes it possible to limit the use of dial telephones to calls having certain prescribed areas. By this method one may, for example, dial any five-cent call within the local exchange district, but should one try to dial a toll call or any call costing over five cents, the toll diversion system will automatically switch the call to an operator. This feature is particularly valuable in large private branch exchanges in industry and business for keeping an accurate record of long-distance calls. It effectively prevents unauthorized use of the telephone.

A development upon which telephone engineers are now working holds the promise of direct dialing of long-distance calls. By this method each city would have a dial code in letters or numbers similar to exchange names. Having dialed the code for the city, the subscriber would then follow with the local exchange code and telephone number of the person he wished to reach in that city. This system is already in use in some European countries.

New types of carrier-wave systems for ordinary cable and wire circuits have increased the capacity of these channels. It is now possible to carry 12 conversation channels on each pair in an ordinary telephone cable and 16 channels on existing open-wire pairs. This development greatly increases the capacity of present facilities and probably will make extensive expansion of wire and cable circuits unnecessary for some time in the future.

Although there are now only about 15 cities in this country which have enough telephone traffic of a nature to justify its use under present conditions, the coaxial cable — a copper tube with a concentric wire inside — has an amazing capacity for the transmission of con-

versations. Over a pair of such cables it is possible to transmit simultaneously 240, 360, or 480 separate conversations, the number depending upon the spacing of repeater stations. The shorter the spacing, the greater the channel. Aside from its possibilities for telephone communication, the coaxial cable holds great promise for carrying television signals.

England has the largest system of coaxial cables, four of which link London, Liverpool, Manchester, Leeds, and Newcastle. One pair is used for telephone circuits, while the other is employed exclusively for transmission of television programs. The only installation in this country is the coaxial cable between New York and Philadelphia.

There are — if you have a statistical tooth — over 37,000,000 telephones in service throughout the world, of which some 19,600,000 are in the United States. Of this number approximately 8,000,000 are dial instruments operating through automatic machine switchboards.

Aesculapius to Mercury

AMONG the most delicate and difficult of the activities of publishing the news is that of presenting in understandable and accurate form reports of scientific developments. Problems of terminology alone would suffice to place this kind of writing among the most exacting; but these problems are augmented by the puzzle of how to explain the intricately technical to the untrained lay mind, by the constant hazard that the lay mind will draw utterly unwarranted analogies with what is written, and by the frequent peril involved in the fact that, in science especially, a little knowledge is dangerous.

In no aspect of its relation with science is the work of writing and publishing more subject to these troubles than in

the task of reporting matters having to do with public health and medicine. Here, more than in any other field, the danger of misinterpretation, of unjustified encouragement, and occasionally of rash application is increased in its seriousness by the fact that the question of life and death is concerned. Dread of disease easily leads the uninstructed reader to see in even a most cautiously worded story basis for hope which in reality does not exist. The moral responsibility of the writer to both the scientist whose work must not be prejudiced and the reader whose natural human impulses must not be misled is a decidedly heavy one.

Award of the Clement Cleveland Medal "for outstanding work in the campaign to control cancer" to the National Association of Science Writers is therefore an event of considerable import. The association, but five years in existence, consists of newspapermen who specialize in the presentation of scientific and technical news. The standards of performance which it has set and which have thus been signalized — involving as they do a still more exacting interpretation of the old-time journalistic requirement of accuracy — promise well for the future relations of science and the press. That these relations will continue to increase in importance is assured both by the growing volume of scientific news and by this evidence of greater confidence which the men of science are

THROUGH DESERT SANDS

... The great man-made river known as the All-American Canal executes this impressive sweep. The canal will carry water diverted from the Colorado River to the great Imperial Valley in the southern part of the Salton Sink, where once was ocean. The lowest portion of this enormously fertile basin is 287 feet below sea level, 300 feet below the bed of the Colorado



The Reclamation Era

coming to place in the men of the written word. Such increased coöperation of the two groups as is foretold in this award must in the end be of inestimable benefit to men in general, particularly in fields such as the control of cancer, where forewarning and consequent early attack on disease may add years to the individual life.

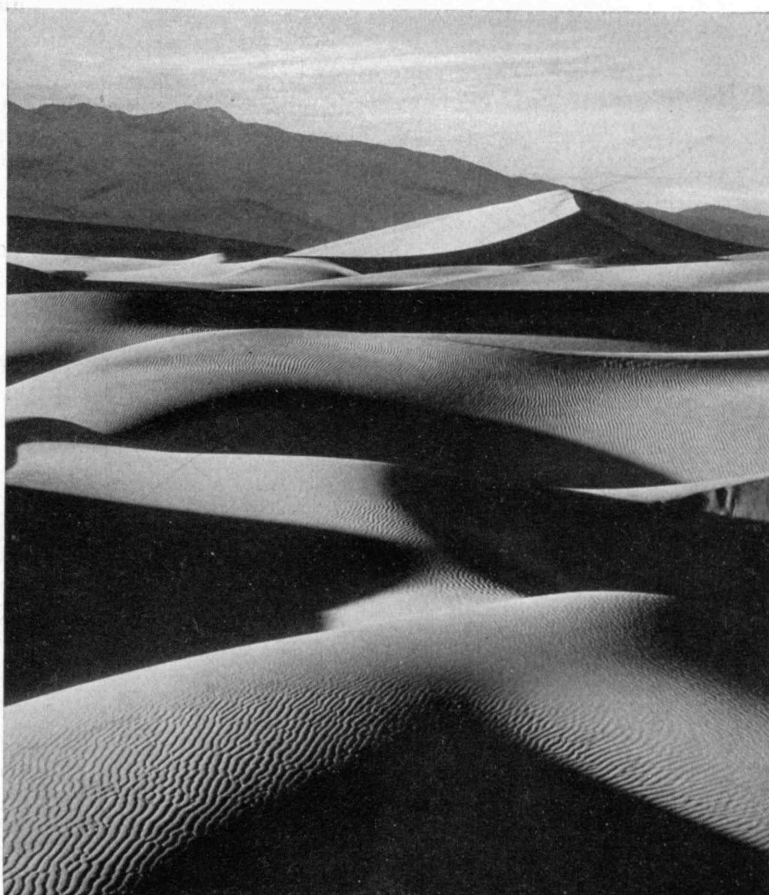
The Spice Trade

ROSEMARY and onions lend atmosphere, voyages by Columbus and microscopes by Bausch and Lomb merge with a distinctly tropical flora for background, pickles, perfumes, and pharmaceuticals yield variety, while canned goods and cattle feed give substance to this survey of the spice trade as of the third decade, 20th Century.

In volume and value, today's trade in spices and related products is insignificant when compared with the huge quantities of minerals and manufactured goods which flow between continents. Were it not for the rise of the synthetic essential oils, the technical advances in this field would not merit a paragraph in an engineering history of our times. But cinnamon and nutmeg can add zest even to a bare statistic, and it is hard to forget that merchants once lined the routes to the spice lands with their bones, that governments fought for aromatic territory, and that the Western Hemisphere is more or less a by-product of the search for the fabulous Indies.

Although their properties as preservatives are no longer vital, their ability to give flavor and piquancy to beverages and foodstuffs still makes spices indispensable. Manufacturers in this country are today using about half a hundred varieties of fruits, seeds, roots, flowers, and herbs, each of which — through some fortuitous metabolic accident — produces an essential oil, or a group of such oils, which is capable of giving the human palate a thrill — a thrill frequently that is without counterpart in the laboratory.

These essential oils, however, are chemicals which often have properties other than flavor or aroma. The bulk of them have some medical qualities; many (as is to be expected because of the close connection between taste and smell) are used in perfumes; and a few have industrial significance. According to a recent tabulation in *Food Industries*, pharmaceuticals use a larger variety of spices than does any other outlet — the ones mentioned as not yet exploited in this field being sesame seed, tarragon, poppy seed, parsley, curry powder, and cayenne. New vistas, apparently, still stretch before the druggist. As might be expected, meats, soups, and canned goods rate high in the number of spices they may contain, but it seems surprising that cows absorb such exotic products as ginger, cayenne, anise, and fenugreek, and that one brand of cigarette (not a major one) features in its advertising the fact that it is the



George A. Grant—Science Service

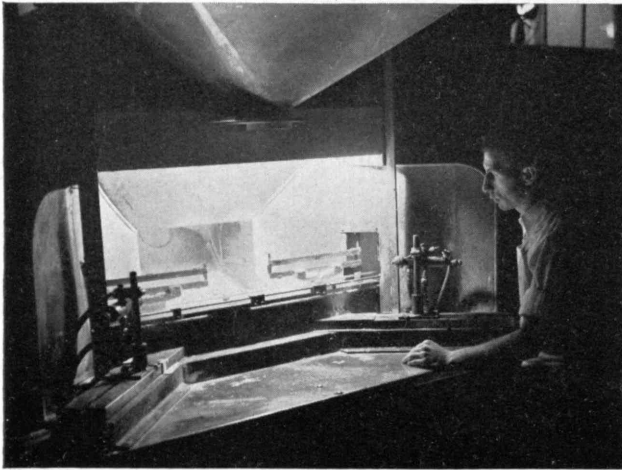
SAND DUNES AT SUNSET

Three hundred feet below sea level, sand on the floor of Death Valley drifts into weirdly beautiful patterns

only unflavored cigarette sold in this country. Among the flavors which the others may contain are cloves, cayenne, mace, and paprika. Four widely used spices — nutmeg, pepper, cassia, and cloves — take part in the manufacture of insecticides. To intensify the industrial note, some tanning preparations contain paprika, saffron, and turmeric. Nor can the family of essential oils deny their relationship to that black sheep, turpentine.

Even this ancient field is not immune to the meddling of technicians. Whenever the flavor of a spice is caused almost entirely by one chemical substance instead of a large number of related molecules, that plant product is frequently replaced by a synthetic counterpart made under controlled conditions and in known concentration. Methyl salicylate tastes and smells like — in fact, is — oil of wintergreen; mustard oil finds competition with allyl isothiocyanate difficult; and the most widely used synthetic flavor, vanillin, closely resembles the aroma of the vanilla bean, the fruit of a climbing orchid native to the land which frustrated Columbus' attempt to reach Cathay.

The flavor of the vanilla bean, of which the world uses six hundred thousand tons annually, is generally applied in the form of an alcohol extract. With this successful technique in mind, several spice handlers have been attempting during the past seven years to furnish every important flavoring and seasoning mate-



RCA Manufacturing Company, Inc.

HERE ARE RADIO TUBES IN THE MAKING

The visual overtones of an industry spectacular in its processes as in its growth

rial in a similar concentrated and standardized form. For better or worse, American manufacturers like to have every can like every other can, and they shudder at French recipes which call for a *suspicion* of garlic or for a *sprinkling* of pepper. In response to this demand for uniformity, the spice handlers are rapidly succeeding in neutralizing the effects of geography, climate, soils, and microorganisms by extracting the spice essences and grading their flavor intensity against arbitrary standards.

Attempts at steam distillation of ground spices resulted in concentrates which represented only part of the flavor; solvent extraction has been found to produce superior results, which fact in turn has posed problems relating to choice of solvent, evaporation techniques, and methods of handling the frequently sticky and viscous residues. These residues are generally diluted to known concentrations in edible carriers like salt or corn sugar.

Because the essential oils are volatile to varying degrees, disinfecting by steam or heat is as difficult as is extraction. And contrary to what one would expect from their preserving and medical properties, spices sometimes carry very large numbers of microbes. Present practice tends toward the use of such fumigates as ethylene oxide and formaldehyde.

Even with bacterial counts and solvent recovery systems, however, the spice trade as practiced by the 200 members of the American Spice Trade Association would probably still appear quite recognizable to the Chinese officials who long ago were forced to hold cloves in their mouths while addressing their emperor (and some advertising man got paid for that idea!).

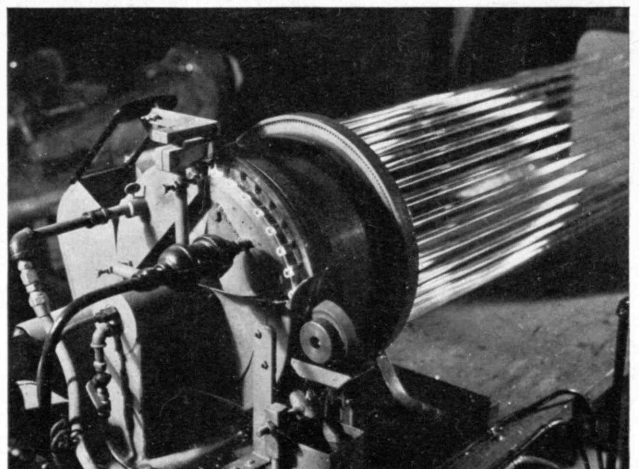
“Science for the Citizen”

BY NORBERT WIENER

THE present age is seeing a recrudescence of encyclopedism. The 18th Century still believed that the whole of science could be put into universally approved and universally read compendiums, but, then, the 18th Century was still an age in which the brain of a man like Leibnitz could in itself be one of these compendiums. In the 19th Century the content of science outstripped the power of any one man to grasp it both as a whole and in all its details, and the scientist deteriorated from a sage to a specialist. In this, our 20th Century, the technique of specialization has so developed at the cost of a broad grasp of learning that we are turning to encyclopedism not as the natural point of view of a man

with any claims to consider himself learned but as a desperate struggle against scientific provincialism, one-sidedness, and ignorance, and as our only hope in our attempt to make science attain its proper social conscience and social maturity. In this important task we owe much to the tradition of literary articulateness of English science and to the breadth of vision of such men as H. G. Wells, Julian Huxley, and now Lancelot Hogben.

The encyclopedists of today face a far more difficult task than did their ancestors in knee breeches and tie-wigs. It was physically possible and not mentally impossible for a scholar of those days to have read everything of importance that the learned world had produced. Nowadays the physical impossibility is as great as the mental. Not only are there no universal scholars but there are no universal mathematicians, and indeed no universal analysts or algebraists or other specialists within specialists. Thus in a book like Mr. Hogben's “Science for the



Citizen,"* it is far more just to praise the many aspects in which his adventure into universality has been successful than to cavil at those defects which inevitably result from his having only the reading and scholarship of one lifetime at his disposal.

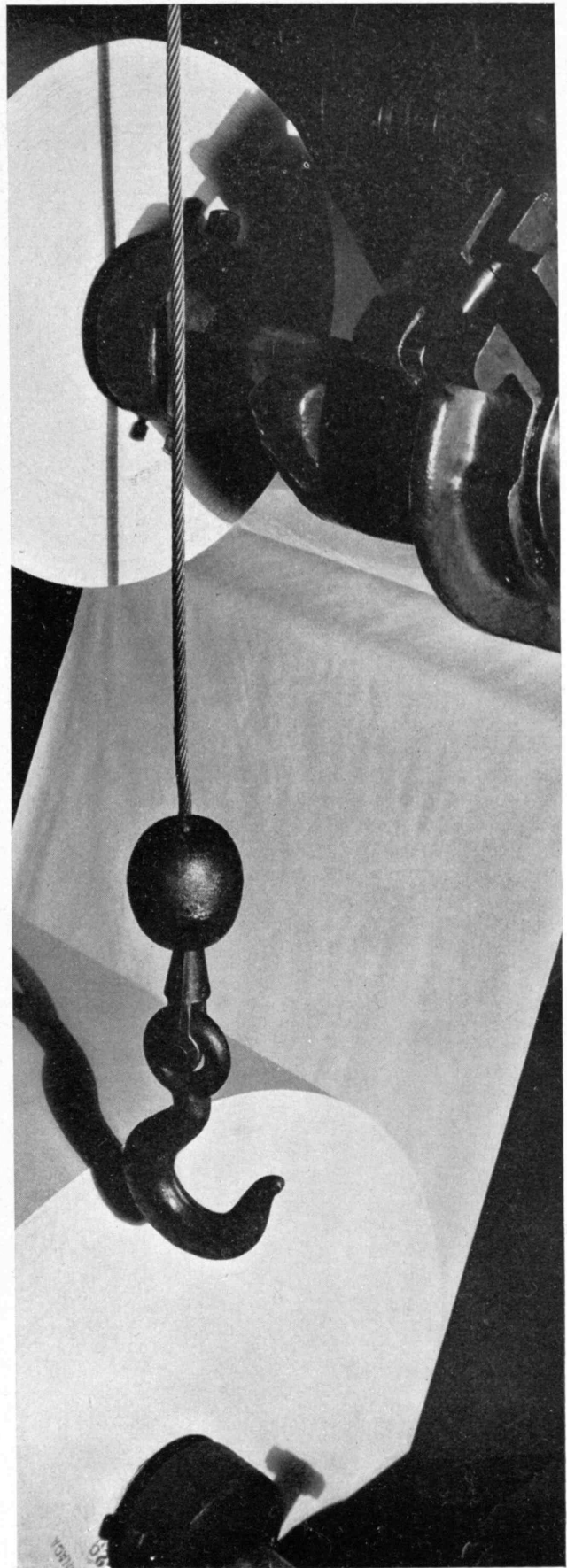
Mr. Hogben's book is entitled, "Science for the Citizen." There are many views possible as to who the citizen is and what are his merits and demerits. No democracy is possible unless the citizen is an individual whom we can treat with respect and to whom we can attribute a due degree of maturity. Mr. Hogben's citizen must be a man who is prepared to think hard and read carefully. Yet he need not in any way be a man whose formal training amounts to more than he can acquire in a good high school or than he can study up for himself if his opportunities have been restricted.

Nevertheless, if he is to get anything like full value out of the more than 1,000 pages which Mr. Hogben has put before us, he must be prepared to work hard. He must be prepared to learn the main facts of astronomy, mechanics, chemistry, heat engineering, the theory of electricity, biology, agricultural science, medicine, and psychology. He must be prepared to think through all these subjects not merely as isolated fields of learning but as matters of vital social significance. A man who can do this and is willing to do this, whatever his formal training, is an educated man. I thank Mr. Hogben for a salute to the intelligence of the community. I thank him for reinforcing the easy flow of his style by examples for the reader to work and to test his own understanding. It is only by the aid of such books that we can hope to build men fit to live in this age of science and to take responsibility for its employment.

But as I have hinted before, a book of this scope will have its weak places; and a man, however able and enlightened he is, will have his pet hobbies. Mr. Hogben has a biting contempt (which I share) for the astronomical theologian and a further biting contempt (which I do not altogether share) for the pursuit of Classical learning. It is easily understandable that the mandarin training of the English youth destined for the employment of his country should excite the indignation of one who sees only too well the harm which this anachronistic point of view has brought to his country and the world. Nevertheless I greatly miss in our own young men the sense of history and the sense of belonging to a world which transcends our own epoch and land, which I find among men with a good Classical training.

With all due respect for the pragmatic and social motive which Mr. Hogben stresses so much in the history of science, I find that he has not done adequate justice even from this side to the theoreticians and philosophers of science. His hatred of Aristotle is understandable enough in view of the paralyzing effect of Aristotelianism on the scientific progress of centuries. But I think this hatred is unduly transferred against the position of Aristotle in his own time and environment. Leibnitz comes in for very little comment, although a most interesting story could be made of the relation of Leibnitz' monadology to the spermatist biology of his times. The names of Heaviside and Gibbs are not even mentioned, though their theoretical work

*New York: Knopf, 1938. 1,082 and 19 pages. \$5.00.



For Tomorrow's Newspaper — a photograph by F. S. Lincoln, '22

is in the most intimate relation to the technical progress of electrical engineering and physics. On the other side it is manifest that while Mr. Hogben knows biology and biological statistics as intimate friends, his interviewer's acquaintance with the various fields of engineering has been largely made for the special purpose of writing this treatise. I do not find an adequate study of the way in which engineering development has been limited by the materials at its disposal, of the way in which it has invented its own materials, of the way in which tools are the products of tools; nor do I find anything like the detailed study of individual engineering inventions which would well fit into the frame of the book.

To sum up: Mr. Hogben has written a courageous, intelligent, and powerful summary of modern science as it appears from the point of view of one single man who, however courageous, intelligent, and powerful of intellect he may be, is yet obliged to look at fields of work oblique to his own with a considerable parallax.

Ultimate Cold

AGELID world in the region of absolute zero, where heat vanishes, molecular motion all but stops, and the behavior of matter takes strange new forms, was described by Dr. Frederick G. Keyes, Head of the Institute's Department of Chemistry, in a lecture of extraordinary importance at the November meeting of the Northeastern section of the American Chemical Society on November 11.

Dr. Keyes's subject was "Low Temperature Research and Its Significance," a field in which he is internationally known as an authority. His audience watched with intense interest when he demonstrated, for the first time at the lecture table, the transformation of oxygen and hydrogen gases first into the liquid form and then into the solid state. This new technique, developed by Dr. Keyes, is one of the most important advances in

its field for many years and makes possible the liquefaction of gases, including helium, without the aid of expensive and heavy compressing machinery. The earlier techniques involved the use of glass and put a severe limitation on the scope of possible experimentation. The new technique employs metal apparatus, eliminating the use of glass entirely, and thus places low-temperature research on an engineering basis.

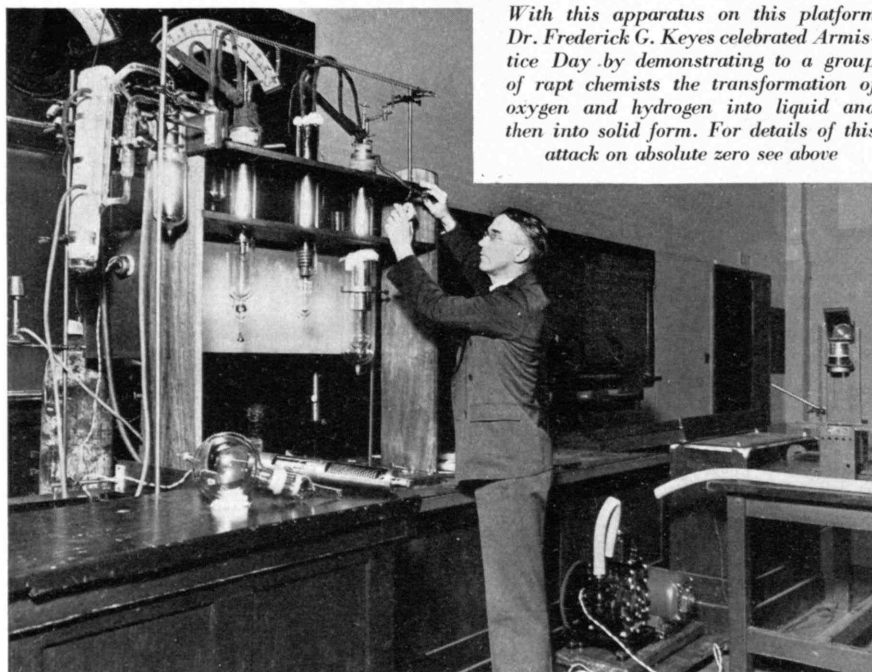
As a simple and economical technique for experimentation at temperatures in the region of absolute zero, which corresponds to 459.69 degrees below zero F., Dr. Keyes's method opens the way to new frontiers for research in the region of ultimate cold. It requires but a third to a quarter of the amount of refrigeration used in older systems, and it is safer to operate. The glass apparatus with which Dr. Keyes carried out his experiments was a model of larger metal equipment which has been developed in the Institute's cryogenic research laboratories. He demonstrated the astonishing increase in the tensile strength of copper at a temperature of 320 degrees below zero F. and also showed the enormous fall in electrical resistance at low temperatures.

Reviewing the history of attempts to liquefy the permanent gases with the objective of attaining absolute zero, Dr. Keyes said: "The object of scientific research in the broad sense is an increasing comprehension of the properties of matter. At the extremes of the temperature scale the complexity of natural phenomena is in many respects simplified. Thus the properties of all known living tissue are either suspended or terminated at low temperatures and completely destroyed at high temperatures. With inanimate nature the chemical combinations which are stable diminish rapidly at elevated temperatures, and finally at the temperatures of the hottest stars there exists only hydrogen or helium. At low temperatures, however, striking variants of the ordinary temperature behavior of matter have become evident. Thus the heat capacity of solids gradually

diminishes, then drops rapidly to become sensibly zero at a few degrees.

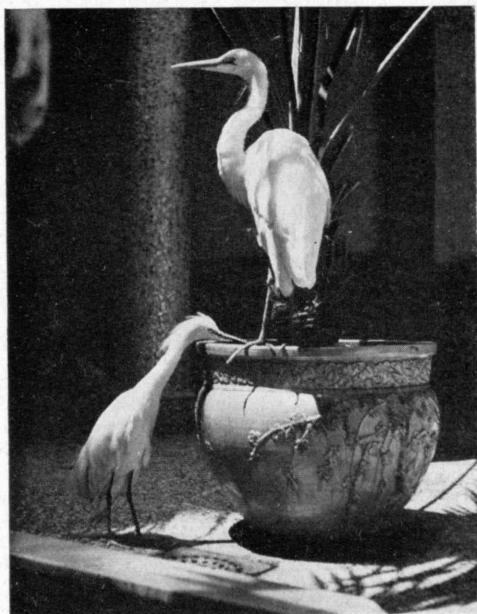
"At lower temperatures the electrical resistance falls until, in the case of some metals, a temperature point is reached where an abrupt drop to zero resistance occurs. Examples are lead at 7.25 degrees C., mercury at 4.12 degrees, and zinc at 0.79 degrees. But this is not all, for on applying a magnetic field the resistance is restored with attendant effects which made evident the lack of generality in our modern electrical theory based on Faraday's experimental work of the last century.

"In time, as electrical phenomena at low temperatures are more clearly understood, a profound modification of the existing theoretical structure will undoubtedly be effected with attendant practical results which may be of



With this apparatus on this platform Dr. Frederick G. Keyes celebrated Armistice Day by demonstrating to a group of rapt chemists the transformation of oxygen and hydrogen into liquid and then into solid form. For details of this attack on absolute zero see above

M. I. T. Photo



President's Palace, Panama City — F. S. Lincoln, '22



Cygnets — Lewis P. Tabor, '22

Our pictorial aviary this month is devoted to exhibits of the exotic and graceful

outstanding significance. At present, for example, it is not practical, because of transmission-line losses, to send power more than several hundred miles from a generating station. This is one of the reasons which make the politician's passion for squandering tax money on high-power developments in remote places so irrational. It is conceivable, however, that scientific research on electrical phenomena at low temperatures, which has already indicated that a condition of zero electrical resistance exists, may lead to the development of the means of transporting the power economically for long distances and thereby salvage something from what otherwise appears pitiful waste.

"The properties of numerous metallic alloys have become known in the past 15 years and have made possible developments in all branches of applied science which would have been believed impossible even 20 years ago. The investigation of alloy properties at low temperatures, both electrical and mechanical, has already disclosed interesting possibilities, but scarcely more than a start has been made in the study. The chief value of these researches will lie, however, in the insight that will be developed into the at present bewildering complexity of the phenomena exhibited by alloys. A whole new world of intellectual and practical interest lies before us.

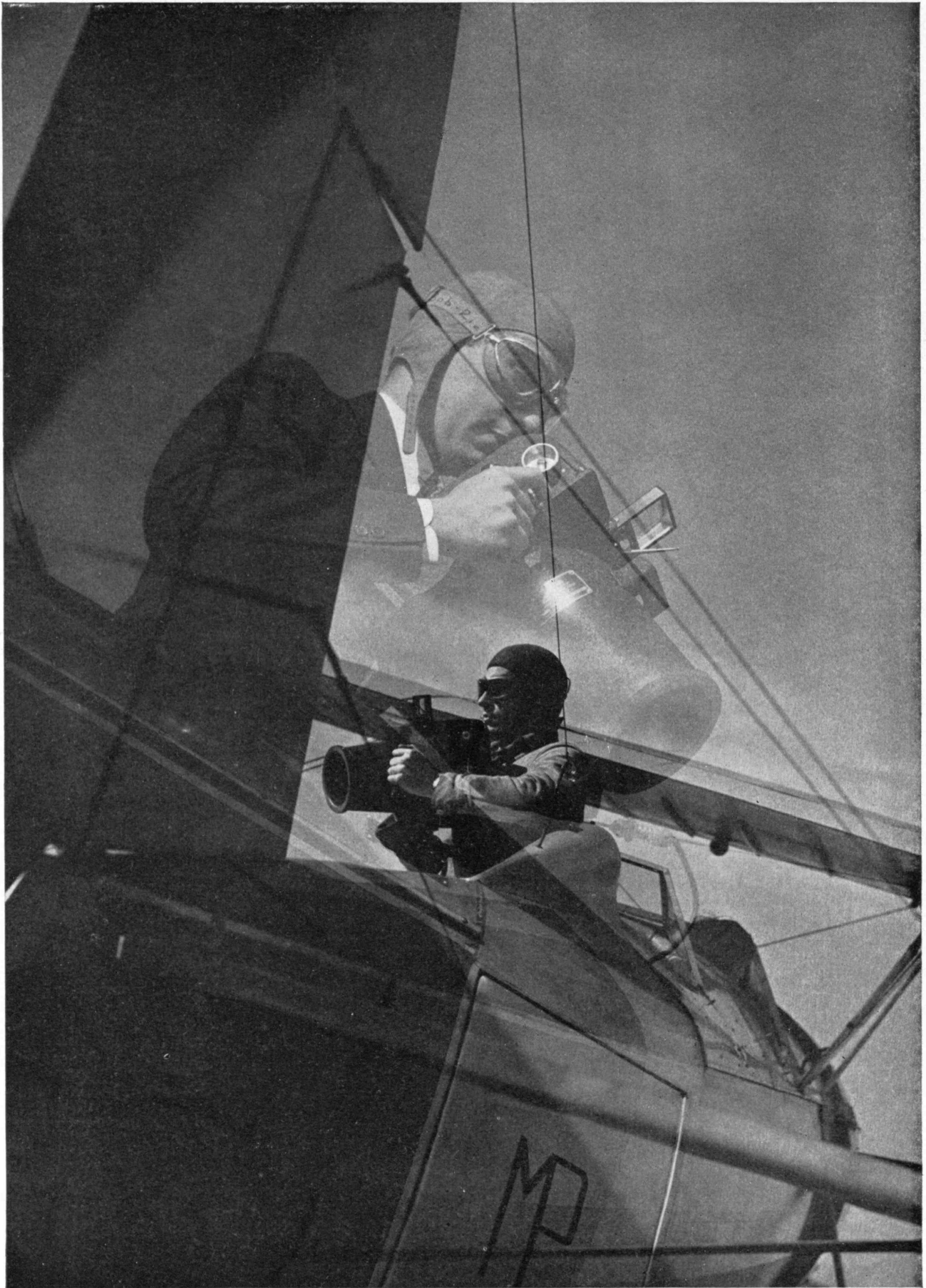
"The conduction of heat in liquids, solids, and gases manifests variations from the ordinary temperature behavior which are most curious. As an example, liquid helium at 2.19 degrees C. undergoes a change in properties. Above this temperature the liquid exhibits the properties we are accustomed to regard as typical. Below this temperature, however, the liquid becomes at least 800 times a better heat conductor than copper at ordinary temperature. The fluidity also augments so much that a vessel which was tight to helium above 2.19 degrees C. may be pervious below this temperature. The heat conductivity of pure copper increases several-fold on cooling to hydrogen temperatures. Some salts

have been investigated and show a minimum of conductivity at very low temperatures. Heat conductivities are, however, difficult to measure, and good procedures adapted to low temperatures have yet to be developed. Because of the relation which current theory establishes between electrical conductivity and heat conductivity, the whole subject is of tremendous importance. What is of scientific importance becomes ultimately, of course, of extending practical importance.

"A field wholly neglected at present is the measurement of mechanical properties at low temperatures, although Dewar started the work and a few new attempts have been recorded lately. What we need are accurate measurements of the temperature dilation, ultimate strength, yield-point characteristics — first for pure metals and then for alloys.

"During the past 20 years the use of x-rays has revealed the structure of crystals or the space arrangement of the atoms in solid matter generally. At low temperatures the vibratory motion of the constituent atoms dies down, and in the case of certain salts called paramagnetic interesting knowledge about the crystal forces becomes possible by utilizing the facts obtained from a knowledge of the magnetic properties combined with those pertaining to the heat capacity and x-ray structure. A knowledge of these crystal forces makes possible the calculation of important crystal properties at ordinary temperatures where applications are already of practical significance in the few cases where empirical knowledge has been available in special instances."

Facilities for low-temperature research at the Institute include the most powerful existing magnets, which were designed and built by Dr. Francis Bitter of the Department of Metallurgy. (See *The Review for January, 1937*, page 116.) The possibilities of these magnets were indicated when Dr. Keyes disclosed that they will enable investigations of matter at the lowest temperatures thus far attainable, namely 0.001 degrees absolute, which is within a fraction (*Continued on page 101*)



*Aerial Photography—*from a photomontage by F. S. Lincoln, '22



THE COLLIER TROPHY
... which this year was awarded
to the United States Air Corps
"for having designed, constructed,
and completely equipped the
XC-35 substratosphere plane, the
first pressure cabin airplane to be
flown successfully anywhere in the
world." For a picture of the XC-35,
see page 73

U. S. Army Air Corps

Higher Highways for Tomorrow

Carrying Sea-Level Comfort Above the Clouds

BY S. PAUL JOHNSTON

WE humans like to think that we are fairly rugged animals, but actually our bodies are very delicately balanced mechanisms that require rather carefully controlled surroundings in order to support the spark of life in them. If it were not for the fact that we have discovered artificial means (such as clothing and heated buildings) for keeping body temperatures constant, we should be limited in our travels over the earth's surface to the narrow confines of the quite temperate zones. Also, if it were not for physical artificial means of keeping the pressure and the chemical make-up of the air surrounding our bodies fairly constant, we would be limited in our vertical travels to a very thin shell of atmosphere, in thickness less than one-tenth of one per cent of the radius of the earth.

Although, to most people, that 15,000 feet of usable air space vertically may seem to afford ample room in which to move about without undue crowding, some of us have become a bit restless under such a restriction. Perhaps it is just that perversity of human nature which sees in natural barriers only a challenge to pass through them. More practically, from the standpoint of aviation, it seems probable that we can fly farther, faster, more comfortably, and more economically in the less dense upper reaches of our atmosphere, provided we can get there and provided that we can stay there for a while once we have arrived.

THE STORY BEHIND THE AWARD OF THE COLLIER AVIATION TROPHY — STRETCHING THE RANGE OF VERTICAL TRAVEL — DIVING AND "UN- DIVING" SUITS — STRANGE AND UNEXPECTED TROUBLES ENCOUNTERED

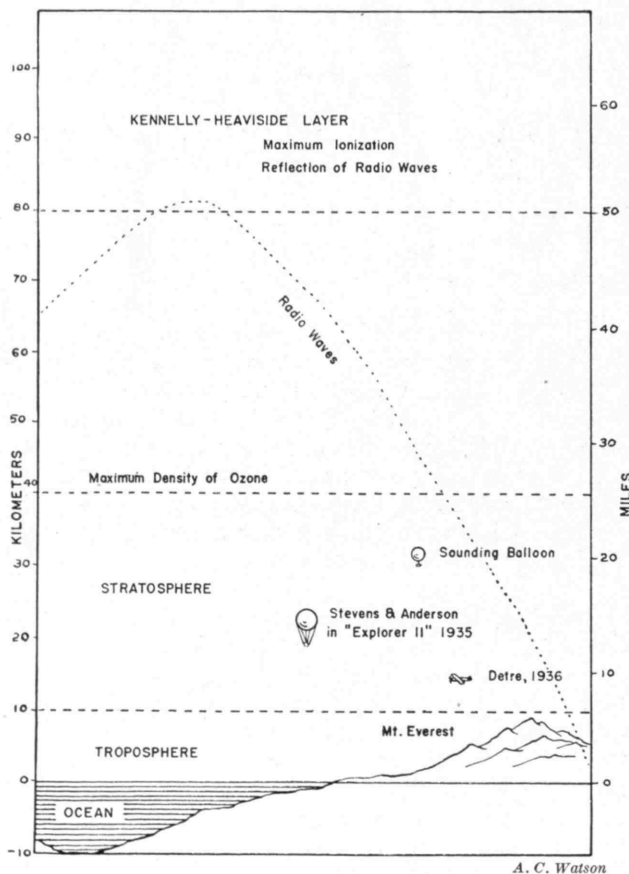
The work of D. W. (Tommy) Tomlinson of Transcontinental and Western Air, Inc., which began in the fall of 1934, marked a new beginning in scientific endeavor to make the substratosphere a passable, tolerable highway. His objectives were: (1) to develop means of supercharging an aircraft engine to develop its rated power up to 30,000 feet; (2) to determine the increase in speed possible for a given airplane with increased altitude at constant power; and (3) to make studies of weather conditions at the base of the stratosphere. The results of his test flights (reported before the Institute of the Aeronautical Sciences in December, 1937, and more recently before Germany's Lilienthal Gesellschaft this past October) provide the base on which will stand all subsequent high-altitude research with airplanes.

From Tomlinson's work, however, it became apparent that to develop machines capable of climbing to, and flying at, substratospheric levels was easier than to keep their pilots and their passengers alive and well in those rarefied regions. It became increasingly obvious that something more than an occasional whiff of oxygen was needed to maintain normal bodily activities. Serious and alarming symptoms took place, which were traceable not only to oxygen deprivation but also to continued exposures to reduced atmospheric pressures as well as rapid changes from one pressure level to another. Anyone who has ever been subjected to descent in an

airplane from, say, 12,000 feet to sea level, while enjoying a slight cold in the head, can easily appreciate the problem. Deep-sea divers and sand hogs working in caissons have the same troubles in reverse. Not that such phenomena are strictly new. An extensive medical literature has already been built up on the subject. Some years ago Wiley Post and some of his predecessors, in shooting for really high altitude marks (50,000 feet or better), built themselves airtight suits and helmets along the pattern used by deep-sea divers. Inside these clumsy and grotesque garments they were able to maintain reasonably normal oxygen and pressure conditions under a wide range of outside variations.

That was a fine idea as far as it went, but imagine asking airline passengers to climb into a combination armor and diving suit and connect themselves up with a sort of central plumbing system just to save an hour and a half's time between New York and Chicago! Not a bit of it! The modern air traveler knows that he is entitled to club-car luxuries and freedom, to a cigarette when he wants it, and to well-served meals aloft, none of which he could have when encased in a shell of rubber and armor plate.

Clearly, that means only one thing. The entire passenger portion of the substratosphere airplane of the future must be built as a pressure-tight tank within which conditions of atmosphere and pressure may be



ABOVE OUR HEADS

Pertinent to the adjacent story is the above diagram of the atmosphere and of man's relatively puny efforts to penetrate it. The pressure-cabin experiments were carried out between five and six miles up



FROM PRESSURE SUITS . . .

kept at, or near, sea-level conditions at all times. Passengers must be able to move about and to carry on their normal traveling activities inside the pressure cabin as readily as they might if they were ashore. And that is exactly what aeronautical engineers and aircraft builders are planning to do. It was for sponsoring the first practical work in that direction that the Army Air Corps was awarded the Collier Trophy this year.

Air Corps interest in high-level flying in pressure-sealed cockpits goes back a good many years. It was tried in a crude way just after the War when a boilerlike arrangement was installed in the fuselage of a DH-4. Lieutenant Harold Harris (now operations manager for Pan American Grace at Lima) set out for the substratosphere in the contraption, but presently returned to earth very nearly in a state of complete collapse. The "pressurizing" had worked, but too well. He had attained considerable altitude without difficulty, but on the descent the pressure relief mechanism had failed to function, and as he landed the air temperature inside his "tank" went to 150 degrees, with a pressure corresponding to 9,000 feet below sea level!

Other matters preempted Air Corps interest after Harris' uncomfortable experience, and the research was dropped for a time. Within the past few years, however, the advantages of high-altitude flying (both for military and commercial use) became so obvious that the project was taken down off the shelves, dusted off, and reëxamined. In the interim, Post and others had been experimenting with their "undiving" suits, and a couple of abortive efforts had been made abroad with tank-type cockpits in aircraft. But little of practical value had come out of any of this work, and the Army decided to start again from scratch.

Mainspring of the new movement was Major Carl Greene, an officer with a brilliant record for getting new things done. Ideas for a practical pressure-sealed airplane had been circulating about under the Greene helmet for a long time, and he found a sympathetic audience for them in Lieutenant Colonel Oliver P.

The Jules Vernish garb which enabled Squadron Leader F. R. D. Swain (left) to live in the extremely rarefied atmosphere 49,967 feet above the earth has now evolved, happily, (right) into the substratosphere XC-35



U. S. Army Air Corps

... TO PRESSURE PLANES

Echols, chief engineer at Wright Field, and in General Augustine W. Robins, who headed up the matériel division. The story was so good that presently the Army purse strings were loosened, and work really got under way. First move was to call in Dr. John E. Younger of the University of California to assist on structural problems. Greene and Younger had been teamed up before on the early work in developing *monocoque* wings and fuselages.

Like all good engineers, they were first concerned with setting up a clear-cut statement of the problem at hand. Starting with the premise that they could obtain a basically satisfactory airplane with engines capable of operating up to 30,000 feet, their preliminary work indicated that at least one satisfactory solution would have to be found for each of a list of 25 subproblems. These 25 broke down into four major groups: (a) structural features, (b) mechanical features, (c) air flow and its regulation, and (d) physiological requirements.

Short of designing and building an entirely new airplane, the shape, type, and size of the structure were more or less predetermined by the machine selected as the work horse. Its design factors had to be carefully overhauled, however, to make certain that it would hold together under the special loads to be imposed on it. Biggest job, perhaps, was to make the joints in the skin airtight under the pressures involved, as no inner skin, or tank, arrangement was contemplated. Then, too, no extensive expansion or bulging of the thin skin under pressure could be tolerated. The stress problem was unusually complicated throughout, as the normal flying stresses were augmented not only by the pressure stresses but by temperature stresses set up by rapid passage from warm sea-level temperatures to the below-zero conditions of the upper atmosphere. Some understandable concern was felt over the question of explosion of the structure in case of a sudden failure of a joint or through the development of cracks, a problem closely associated with the proper design of bulkheads and

other internal structure. And something else to think about was how windows could be made large enough to see through properly and still stand the pressure.

Mechanical problems were as complicated as the structural. How to seal doors and emergency exits? More complicated, how to seal off the large number of small openings needed for the passage of moveable control wires and control rods to operate the control surfaces and all the gadgetry on the engines? How to remove, or to prevent, fogging and frosting of windows, both internal and external? It seemed desirable, also, to provide some sort of automatic window flaps to hold air pressure in case of accidental breakage of a pane of glass. It seemed to make sense, also, to consider means of utilizing the dynamic air pressure and the energy of the air discharged continuously from the cabin.

The air flow in the cabin and its regulation posed some unusual problems. Extremely light and extremely efficient compressor (supercharging) equipment had to be designed, fitted with highly sensitive and fully automatic regulation of quantity and pressure, free from noise (both aural and radioelectric), and entirely free from any danger of freezing up at altitude. Safety valves, both inward- and outward-opening, had to be provided. And in case of the failure of the supercharger, or of any of the parts of the system, means had to be found for the automatic sealing of the ventilating system and the release of an oxygen spray.

For the physiological factors, not much could be determined before making actual flight tests in the completed airplane. The list of problems to be solved, however, contained questions of how much air is required per hour per passenger, what pressure ranges might be tolerated, what rates of compression or discharge of air would be permissible in an emergency, and how to control cabin temperature and humidity. Once these two-dozen-odd problems were set up and understood, the team of Greene, Younger, *et al.*, went to work writing an actual specification for an airplane to meet them. No need here to detail the blow-by- (Continued on page 90)

Powder Compacts

. . . and not for Cosmetics. The Story of Metallurgy's New Art for Confecting Materials Previously Unknown in Industry's Cuisine — with a Homily on the Need for Less Secrecy and More Published Information and a Note on Education's Contribution

BY JOHN WULFF

IT is treading on the quicksands of metaphor to bracket the metallurgical and culinary arts, but the two have seemingly so little in common that they provide an apposite contrast to point up this story on powder compacts.

Since antiquity, for example, able culinarians* have been sophisticated enough to recognize that pastry making is so different from soup or meat cooking that its special talents and techniques unfit the artisan of one for the skilled practice of the other. Few metallurgists have ever been endowed with quite this type of acumen. It is a credit on their side of the ledger, however, that they have recognized the value of science, using it as well as contributing to it, in contrast to the culinarians who have found it more to their liking to wive on the fringe of the fine arts and frown on bespectacled science.

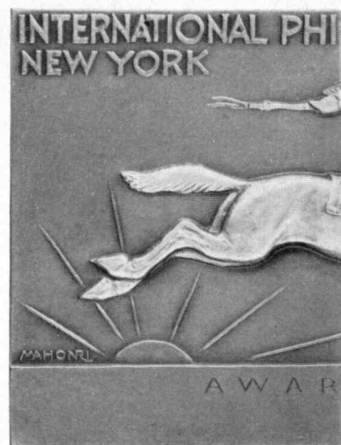
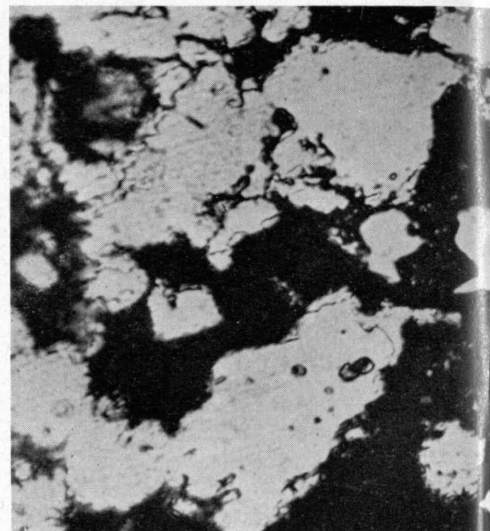
The metallurgical arts have continued improving processes for the winning of pure metals from ores since early Chinese and Babylonian times by methods whose essentials are the same today. Indeed the early methods for alloying, casting, shaping, and otherwise working metals have only been refined. In the 19th Century two major innovations which stem from the work of scientists changed the orthodox picture slightly. These were the refining, if not the winning, of some metals by electrolysis and the making of new bulk materials, otherwise not possible, by annealing briquetted powders. Since then both innovations have improved greatly, spurred on by technological advances in other fields. Metallurgists as merchants, artisans, or scientists know all too well that the second of the two methods can never displace the techniques of the older metallurgy or become a major producer of the metal articles of commerce. But powder metallurgy can produce useful marketable objects which cannot be made so efficiently otherwise. Thus the powder metallurgist with culinary acumen is beginning to be recognized in his own right as the pastry maker among his more orthodox fellow artisans.

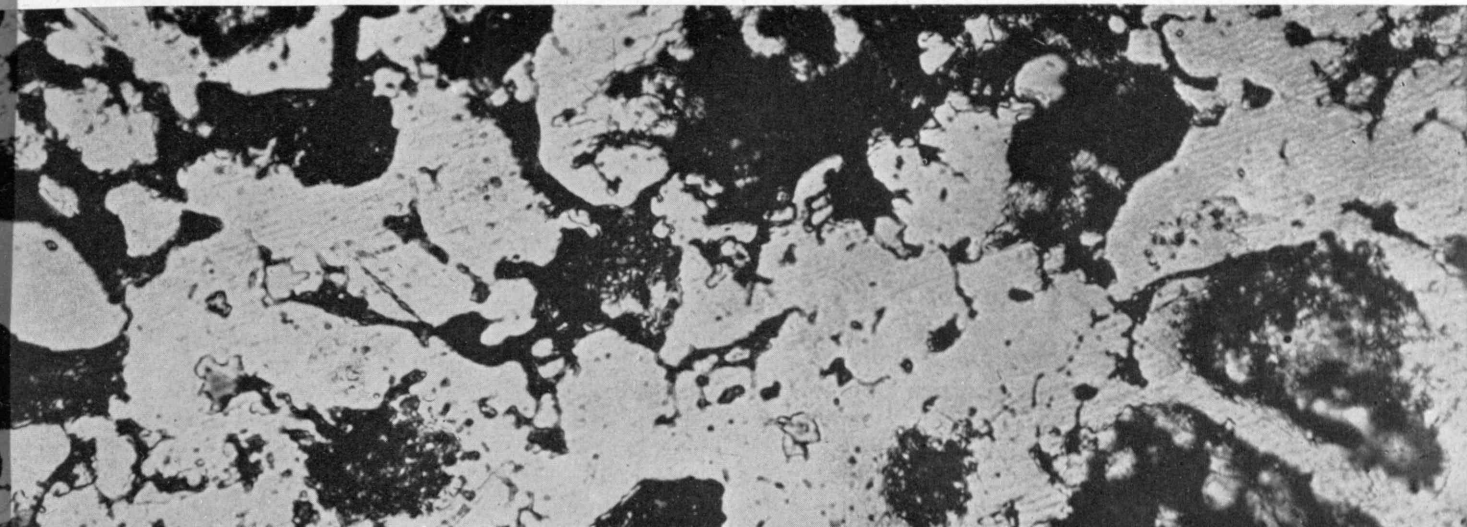
What then are the powder metallurgist's activities? He is interested first in the production of fine metallic powders from natural and artificial compounds or from

*This word is not in the dictionary, but it ought to be.

bulk metal. With end product in mind he mixes finely made and graded powders in combinations considered heretical for metal soups. He feeds the powders, once mixed, into a tapered die made of extremely hard steel and then with mighty presses forms them into a briquette. Thereupon he carefully anneals the resulting briquette at subfusion temperatures. The product now is ready for further fabrication or application according to more usual techniques.

The metal powders which he uses, possessing different physical and chemical properties, are produced by such varied methods as machining, stamping, spraying, condensation, chemical and electrolytic precipitation and reduction. The selection of the method is dictated by the nature of the raw materials and the requirements of the finished product. Thus, copper, molybdenum, nickel, cobalt, and tungsten powders may be obtained by heating their oxides in hydrogen atmospheres. Calcium hydride has also been employed in the reduction of the refractory oxides of titanium, chromium, and zirconium. Other oxides, like tantalum, are not reduced by hydrogen but are made by the electrolysis of fused salts. The electrolysis of aqueous solutions employing control unsuited for good electroplating is responsible for a large percentage of the powder now used. Gold, silver, and metals of the platinum group are more often precipitated from aqueous solution by reducing agents. Nickel and iron can be efficiently made by the decomposition of their carbonyls, which are gaseous compounds; but the resulting product, if pure, is usually too expensive. Copper powder can be made by most of these methods in sizes as small as 50 microns to 60 microns. Under the microscope the shape of the particles may vary from a nearly spherical to a fernlike structure, depending on the method of production. Since the cohesive quality of the powder depends on other factors besides shape and size, chemical analysis for impurities, especially oxides, must be carried out;





measurements of the apparent density and the rate at which a given weight of powder will flow through a measured orifice are also determined. The latter factor is important where the pressing operation is automatic.

With a supply of suitable metal powders available, the powder metallurgist mixes lots of different mesh sizes, as well as different elements, in tumblers or ball mills. This step is exceedingly important if pressing and annealing are to be effective later. If a certain porosity is needed, liquid or solid chemicals which evaporate in the annealing process are mixed with the metals. For special applications, other nonmetal powders are included in the mix; porcelain powder in spark-plug material and thorium oxide in tungsten to inhibit grain growth or to increase thermionic emission of vacuum tube filaments are examples. The mixing operation may extend from a few minutes to as much as a few days.

The thoroughly mixed powders are now ready for the mold or die. Much ingenuity and care are exercised in the construction of these devices. They must be able to withstand pressures up to 350 tons per square inch, and their walls should be made of materials which exhibit as low a coefficient of friction as possible. Tool steel alone or with stellite or carbide liners is often employed. With hydraulic-, cam-, friction-, or knuckle-type presses, usually capable of from five ton- to 100-ton pressure,

the powder is compressed to as little as one-third or one-eighth of its original depth. The rapidity with which the pressure is applied may alter the final properties of the compact. Slow compression often results in entrapped air and in density variations. Some pressing is carried out at elevated temperatures.

The briquette made by compression is not only of greater density than the original mass but is of remarkable strength because of the welding or sintering of the original powders of the compact. In the beginning the powders are probably all covered with a film of oxide or adsorbed gas. During compression this film is ruptured because of mutual abrasion and welding of the particles which takes place at the points of contact. The reason for such adhesion is little understood.

All briquettes are usually heat-treated after compression, either in controlled atmospheres or in vacuum at temperatures well below the melting point of the constituents. Sometimes, notably in carbide tools, one of the components may even melt. Properly heat-treated compacts are usually stronger and possess more advantageous properties than untreated ones. Whether this difference is due to the reduction of volatile solid impurities, to absorption or elimination of gas, or simply to diffusion is again not known.

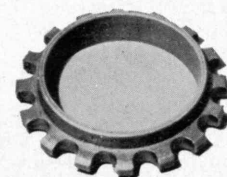
From powder experiments with metals which mix readily with one another in the liquid and solid states, it is known that diffusion may take place quite rapidly at even low temperatures. At elevated temperatures, grain growth may occur to an extent which makes it difficult to distinguish the material from alloys of equivalent composition produced by casting. Where diffusion and grain growth have occurred, the residual porosity of an annealed powder compact is exceedingly small. Density measurements on sintered gold and copper briquettes bring them within one per cent of the density of the bulk material. Although grain growth is not always desirable, reduction in porosity usually is. If porosity is intentionally decreased by annealing, there is naturally a slight shrinkage and sometimes even a warping of the finished compact. When the amount of shrinkage cannot be adequately allowed for, the article is machined or compressed to proper dimension and the surface finished.

ACCOUNT of some of the products already made in this manner suggests the development and possibilities of the art. Platinum in usable form was the first metal to be so produced by Wollaston in 1828. The

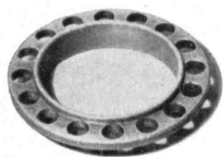


Above. Photomicrograph of an oilless bearing made from metallic powder. Note the interstices which hold oil like a sponge and exude it when the temperature of the bearing rises

Left. Medallion made by one blow of 50 tons per square inch. The rider and horse are of gold; the background of bronze



other high melting-point metals used in the electronics industry, namely, tungsten, molybdenum, tantalum, are similarly made. Even if fusion methods were more efficient than they now seem to be, melted products of tungsten would not be readily useful because of their excessive brittleness. Of more recent invention are the high-speed cutting tools made by compressing extremely hard particles such as carbides, borides, even diamond, with more malleable powder materials, such as cobalt. Although cobalt is fusible, the other components are not; so melting is as impossible here as with tungsten. Electric contact and welding accessories, having high conductivity and other especial physical properties, have been made by compounding silver or copper with tungsten, graphite, molybdenum, titanium and zirconium. More novel than this are the so-called oilless bearings compressed from powders which ordinarily readily fuse yet are without uniform porosity. They are made by compressing the original powders with volatile salts which disappear after the annealing, leaving a continuity of pores in the material without endangering the strength of the bearing. When oiled, the material may be said to soak up the lubricant in this system of pores, and so remains oiled for an appreciable length of time.



All of the above examples, as indicated before, can be produced only by powder technique. A great number of other objects previously made by melting methods can be more efficiently made by the powder method. Thus, casting impurities and segregations have been avoided, rigid control of composition has been obtained, and in some cases, notably with precious metals, excessive machining and scrap losses have been eliminated. Magnetic materials, thermostatic and other bimetals, stainless steel and other noncorrosive alloys, and dental alloys are but a few of the many applications.

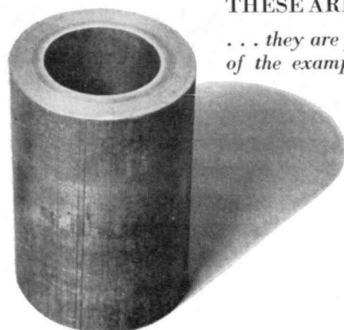
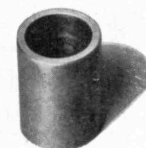
The present industrial development of powder metallurgy as an art is definitely limited by certain natural and artificial factors. These may be more or less temporary, yet it is necessary to reckon with them. The first limitation and the most important is physical. The high pressure required to form uniform briquettes establishes definite dimensions. As the power of hydraulic presses is increased and as the special molds used are improved, it may be possible to handle larger pieces, but in such cases the cost of equipment may become excessive. The second factor worth mentioning is the patent structure of the industry. The older independents and newer workers in the field have severely criticized the larger electrical

industries and their associates who control the basic patents for withholding much general and practical information. This situation has to some extent changed, but it is equally noticeable at present that some of the same critics have also begun to swamp the patent office with applications and have limited their own publications to papers which are of more promotional than constructive value. All of this has its good and its bad sides, depending on one's point of view. It indicates, however, that if powder metallurgy is to progress, published studies of the fundamentals involved in the manipulation and manufacture of powders, the mechanics of compression and annealing, and the physical and chemical properties of compacts are necessary. With one accord people within and without the art are beginning to look toward academic and other research laboratories for fundamental information.

The basic scientific problems of powder metallurgy are also the basic problems of the solid state about which theorists and experimentalists in different sciences have been worrying for some time. Why a metal powder produced by one process should have physical properties so different from those of a powder of the same metal produced by other methods may be one of the simpler problems still to be answered in this field. But why compacts made from powders exhibit such exceptional strength is certainly not easily answered. We say they are welded together. Welding connotes fusion, and, to be sure, in the customary welding process, heat and pressure are often applied and fusion results. Nevertheless, there are many examples where fusion never occurs, yet the resulting bond is remarkably strong.

The metallurgist who, in recent years, has accumulated a large amount of data on diffusion in metals and on the related problem of surface alloying at subfusion temperatures immediately brings his battery of facts into play and claims that welding results in a diffusion bond between adjacent components. The present Lord Rayleigh has demonstrated, however, that two optical glass flats in intimate contact cling together with a force of 654 pounds per square inch. The possible force is probably much larger if we consider that even two optical flats are not in perfect contact. This demonstration of the forces of cohesion is a simple assessment of their magnitude. When we understand more about the cohesive forces in single crystals, then also shall we understand more about welding and the processes of powder metallurgy. Fortunately there have been a few great experimental pioneers like Professor P. W. Bridgman of Harvard University, who have worked on this problem of cohesion and now, with the recent advancements in the theoretical physics of solids, we can already see semblances of order in what only a few years ago seemed a chaotic subject. That the results of this work will be applicable to an interpretation of the problems of powder metallurgy no metallurgist will deny who considers his subject an engineering science.

"What are the engineering schools going to do about the new developments in this field?" is a question often asked by people in industry. (Concluded on page 101)



THESE ARE NOT CAST OR STAMPED

... they are pressed from powder, and most of the examples scattered on this page are oilless bearings. The tube at the left contains a lining pressed from powder inside a steel tube. Bimetallic objects can be made wholly by powder-compacting methods.

These illustrations were supplied by Charles Hardy, one of the pioneers in powder metallurgy

New Demands on Technology

The Influence of Technical Progress Upon Social Development

BY KARL T. COMPTON

THE BOGEY OF TECHNOLOGICAL UNEMPLOYMENT — TECHNOLOGICAL PROGRESS AND CULTURE — ADAPTING MANAGEMENT TO MODERN NEEDS

THAT our national health, prosperity and pleasure largely depend upon science for their maintenance and their future improvement, no informed person would deny." This opening sentence in the 1935 report of the Science Advisory Board to President Roosevelt epitomizes the judgment of that body of 15 prominent scientists, engineers, and medical experts on the present-day influence of technical progress upon social development. In accepting this assertion of the scientists, we may at the same time hold that there still remain many aspects of the influence of technical progress upon social development which challenge attention. I shall mention briefly four of these.

(1) *The Bogey of Technological Unemployment.* In recent years much discussion has centered around technological unemployment — the loss of work due to obsolescence of an industry or use of machines to replace workmen or increase their per capita production. Are machines the genii which spring from Aladdin's Lamp of Science to supply every need and desire of man, or are they Frankenstein monsters which will destroy man who created them? Startling examples of both viewpoints can be given. I shall only try to summarize the situation as I see it.

If we look at industry *as a whole*, without inquiring into particular cases, we would conclude that technological unemployment is a myth, because statistics show no decrease in the fraction of our population gainfully employed during the last few generations in which machine production has become important. This is because technology has created so many new industries and has so greatly increased the market for many commodities by lowering the cost of production to make a price within reach of large masses of purchasers.

In individual instances, however, technological unemployment may be a very serious social problem, as in a town whose mill has had to shut down, or in a craft which has been superseded by a new art. For example, the photoflash lamp has been a very useful development in the art of taking flashlight pictures and has largely increased activity and employment in this art, but it did suddenly take away the jobs of those who made the old-fashioned magnesium flashlight powders. Here the fact that technological unemployment does not exist as measured by over-all statistics is of small comfort to the families whose wage earners have lost their jobs.

I believe that two principles should guide us in these matters. Improved products and services should be made available to the public and not forcibly estopped to protect any entrenched business or any group of workers who would be thrown out of jobs by the change, but with this proviso: The change should be made in a manner to afford generous protection to the workers affected by it. This is a definite job for management, in which efficiency should be tempered by humane considerations (an attitude which, I believe, makes for real efficiency in the long run). Various methods are available for reducing the shock of technological changes, such as retraining workers, gradual change-over to fit the normal turnover of personnel (as followed by the telephone companies in introducing automatic switching), pensions and unemployment insurance, efficient employment agencies for labor exchange, coöperation between industries of a community to synchronize layoffs in one company with new employment in another, and so on.

In any case, I believe that the fundamental criterion for good management in this matter, as in every other, is that the predominant motive must not be quick profits but best ultimate service of the public. This is a topic in itself which deserves much elaboration, but I must leave it to your own thoughts for interpretation and application.

(2) *Technological Progress and Culture.* In discussing the influence of technical progress upon social development there is a natural tendency to emphasize only the material products of technology, forgetting that social development is more an intellectual and spiritual than a material process, and overlooking the influence of technology on the cultural aspects of society. What, therefore, is the cultural influence of technology?

The first point which strikes one, in a long-range view, is that man's achievement in every age has been made possible by, and limited by, the tools at his disposal. These limitations are, in fact, recognized in the names attached to the various stages of civilization, such as the Stone Age, the Bronze Age, or the Age of Steel.

The second significant fact is that technical progress has created opportunities for cultural development by affording the necessary time and facilities. In the ancient "golden eras" when art, literature, law, and philosophy made great advances, these were possible because the Egyptians, Greeks, or Romans possessed slaves or, in the Renaissance of Europe, serfs, who performed the menial tasks and produced the wealth which gave time and energy for intellectual and artistic pursuits to a fortunate few. Granting the intellectual greatness of Aristotle, his achievements were certainly enhanced by his freedom from ordinary work and by the services of 10,000 research assistants, put at his disposal by King

Alexander to bring him information of all sorts from all parts of the world.

In our day and generation, machines and mechanical power have taken the place of slaves in producing that large per capita productive power which makes possible time and money for education, recreation, pensions, short hours of labor, literature and news from all parts of the world, and travel. In the United States the mechanical power used is equivalent to an average of the full-time work of 50 slaves for each person.

Thus technical progress has afforded opportunities for cultural improvement. To some extent these opportunities have been utilized advantageously. We wish they were utilized better, and this, again, is a challenge to management as well as to education and religion.

(3) *The New Demands on Technology.* A survey of present-day social problems discloses some very definite directions in which technology can assist toward their solution.

Some millions of people want work — respectable, creative, remunerative, permanent employment, and not temporary makeshift jobs or doles, or the dangerous device of producing war materials beyond reasonable requirements for defense.

All, including I believe the administrators of the great relief agencies, and with only the possible exception of a few selfish politicians, would like to see it possible for the government to withdraw from the business of unemployment relief through the creation of new employment in the regular channels of industry, agriculture, and commerce. The ideal goal is reduction of Federal relief, as rapidly as regular employment can take up the slack, down to a minimum which will take care of unavoidable cases of technological unemployment in the transition period between jobs and will use this labor in the improvement of the public services and facilities for which the government is responsible. Floods, droughts, dust storms, and encroaching soil erosion have focused attention on needs for safety and conservation on a very large scale. Acts of Congress and studies of the National Resources Committee attest the concern over problems of this type.

Without giving more examples, perhaps we can summarize by saying that the unemployed want work; industry wants profits; agriculture wants new uses for its products; national resources ought to be more wisely used; natural hazards should be curtailed; labor wants shorter hours and higher pay; all the people want more wealth, lower income taxes, better health and comfort, additional facilities and commodities.

Every one of these desirable social developments can be realized only through the action of two forces: the force of better technical developments and the force of better management. Better technical developments call for scientific and engineering research, training of research workers, adequate funds and facilities, and time. Better management, whether in business or in government, provides adequate attention to scientific research and requires better understanding of problems, wiser formulation of policies, and greater efficiency in their execution.

(4) *Principles of Management.* My few years of experience as executive officer of an educational institu-

tion do not qualify me as an expert in management, for college faculties manage themselves and college trustees manage the business. From time to time a college president may be like a drop of oil in the machinery, or a flashlight in the dark, or a signpost at the crossroads, or a dentist in his office, or a prophet crying in the wilderness. But when things are as they should be, there is no friction to require oil, no darkness to require light, no bad teeth to be extracted, the faculty already knows the best way at the crossroads, and everybody is exploring the wilderness. So I cannot presume even to suggest how management problems can best be understood, wise policies formulated, and efficient execution assured. At most I can only venture to suggest certain general principles of management which seem to me to be fundamental.

The first of these is that management is an essential attribute of decent group life. Without it there is chaos, discord, and ineffectiveness. Without it there is no security; and complete freedom from controls does not give liberty but rather the worst of all subjugations — anarchy without protection. But with management comes orderly procedure and directed cooperative effort, so that the group becomes greater than the sum of the individuals which compose it. Undoubtedly the increasing complexities of modern life, due largely to technological progress, require a continually increasing degree and quality of group management.

The second principle is, at first glance, the antithesis of the first. It is that wise management involves the minimum of control and supervision consistent with reasonably smooth, coordinated, and properly oriented operation. It is an evolutionary principle that as individuals or groups grow in their ability to accept responsibility, the controls imposed on them are relaxed in order that they may accept and discharge responsibility. In this manner they develop their own powers and increase the contributions which they can make to their social group. This is a basic principle in training young animals and children, in training young executives, and in developing divisions of an organization.

The greatest of all management problems today is to determine the most advantageous balance between these two principles. How much management should be exercised and to what extent should it be centralized? The question arises in business and in government.

In industrial organization, in America at least, the pendulum is swinging definitely in the direction of less centralization of management, as well as less centralization of capital and of operating plant. The reason is that experience has shown too great centralization of control to be inefficient and also hazardous. The great desire of business now is to develop personnel who can wisely discharge responsibility and take initiative, rather than to depend upon an army of obedient, hard-working, but unimaginative employees taking orders from the boss.

Large groups always evolve more slowly than small groups; so it is not strange that governments in many parts of the world today are rapidly moving in the direction of increasing the scope of management and its greater centralization, sometimes even into the hands of one individual. This was the trend of our industrial



ENTRANCE

M.I.T. Photo

. . . to the new Rogers Building as it appears at night from Massachusetts Avenue

organizations a couple of generations ago. A fair evaluation of this tendency in governments discloses that it has in many cases come about from natural causes, such as insoluble complications resulting from the Great War, or the previous relaxing of controls before a perplexed people had developed the power to accept the concomitant responsibilities, or for other reasons. As was the case in overdeveloped industries, the dangers in this movement in governments lie in such factors as present or future mismanagement on a large scale, disregard of the rights of other groups in the confidence and ambition of their present strength, failure to develop enough independent leadership within the group, inefficiency and inability to secure any true evaluation of results or policies because of suppression of criticism.

The dangers confronting the less centralized democratic governments, on the other hand, are likely to be indecision in crises, inconsistency of policies, inefficiency in operations, continual necessity for compromise between groups. We of democracies, however, believe that in the long run there is strength even in these apparent weaknesses, because they guard against rash actions, they develop the average intelligence and responsibility of the whole population, and the whole setting encourages individual development and free enterprise. We find justification for our belief in the record of economic prosperity, high standard of living, and funda-

mental happiness of the people in those countries where democracy has been a spontaneous development from within, not imposed from without.

These are very important questions of management on a large scale facing most of the people of the world today. Our brethren in some countries are putting their faith in the highly centralized management of dictatorships and authoritarian states. Our brethren in other countries, and we in America, have put our faith in a form of government definitely designed to serve and not to manage the citizens, and to give maximum opportunity for free initiative and free expression. This situation offers a great opportunity to watch the results of the two sharply contrasting theories of management as an experiment on a colossal scale. God grant that our observation of this experiment be not interrupted by any action that will do irreparable damage to all people in both groups.

In all organizations there is one danger which operates insidiously from within and which, paradoxically, is greatest in those organizations which are most successful. I refer to the danger of complacency. It does not exist in a young industry in the full vigor of growth or in an older industry which, like an athlete, is kept in trim by the exercise of competition. But it is a real danger, which grows with age and success. It is greatest in an industry which (*Concluded on page 90*)

The New Bomb Bogey

BY TENNEY L. DAVIS

A war-jittery world, fooled even by a radio play describing an attack from Mars, has read with horrified acceptance news reports of a dreadful new liquid-air bomb devised and used in Europe. To get the facts about this type of bomb, The Review went to an authority on explosives, and here are his comments. THE EDITOR

IF a mass of absorbent combustible material, say a paper cylinder filled with wood pulp or powdered cork or spongy aluminum, is dipped into liquid air, the liquid air is absorbed by the combustible material — as water is absorbed by blotting paper — and the resulting mass is a powerful and sensitive high explosive. The paper cylinder becomes a cartridge of dynamite. It may be made to explode conveniently by means of a blasting cap. But since it is rather sensitive to shock, it may also be made to explode accidentally by improper handling. Liquid-air explosives, or liquid-oxygen explosives, have clear-cut advantages and disadvantages and have definite limitations to their usefulness.

Liquid-oxygen explosives are so sensitive that they cannot safely be transported from place to place. They are conveniently used by loading the nonexplosive combustible material into the place where the explosive charge is desired and then by pouring upon it as much liquid air as it will absorb. Thus, the explosive is manufactured in the very place in which it is to explode. Another reason why it is not desirable to move liquid-oxygen explosives from place to place is that they are transitory. The liquid air evaporates, and the material ceases to be an explosive. This property of the explosives gives them a great advantage for certain purposes. If a stick of dynamite fails to explode after it has been loaded, it is thereafter decidedly unsafe for a workman to go into the place with pick and drill. But an unexploded cartridge of a liquid-oxygen explosive retains its explosibility only for an hour or two and thereafter may be battered by pick and drill as safely as any other inert material.

The facts that liquid-oxygen explosives must be prepared immediately before they are used, that they will not keep, and that they are readily sensitive to shock render them unfit for strictly military uses. If they could be loaded into shells, the shock of shooting them from a gun would make them explode before they had left the barrel. The gun would be destroyed, and the artillerymen would be killed.

Subject to their limitations, liquid-oxygen explosives are still useful (and cheap) for civil purposes and for the pseudo-civil purposes of the military engineer. During the World War the German military engineers used them behind the lines for demolition purposes. The liquid air was brought to the place in large steel, vacuum-jacketed cans, built like huge thermos bottles, in which the liquid air — kept cold by its own evaporation — could be preserved for a long time. Nothing, of course, could prevent its ultimate evaporation. Sometimes the liquid air was prepared where it was to be used, by portable liquefying machines transported by motor truck.

Liquid oxygen constitutes about one-fifth of freshly prepared liquid air and a larger portion of older material from which part or all of the more volatile liquid nitrogen has been allowed to evaporate. Liquid air and liquid oxygen, however, are to all intents and purposes the same thing as far as the preparation of liquid-oxygen explosives is concerned. Liquid oxygen boils at -182.5 degrees

C. at atmospheric pressure. At higher pressures it boils at higher temperatures (at about 50 atmospheres it boils at -118.8 degrees C.), and it cannot be kept in the liquid state above -118.8 degrees C. no matter what the pressure which is put upon it. If a quantity of liquid air at very low temperature is confined in a strong, closed vessel and allowed to warm up, the vessel at ordinary temperature will contain compressed air, not liquid air. The pressure of the air will be enormous, and the vessel will have to be exceedingly strong to hold it. Such a vessel would evidently not make a practicable shell to shoot from a gun or a bomb to drop from an airplane.

If liquid-oxygen explosives could be loaded into bombs and if such bombs could be carried by airplane, they would still not be suitable for military use because of their great sensitivity to shock. An enemy bullet striking the bomb would certainly cause the destruction of the airplane which was carrying it. The only conceivable way in which liquid oxygen could be used practically in an explosive drop bomb is one in which the liquid oxygen is added to the combustible material, that is, one in which the actual explosive is formed, after the bomb is in flight.

During the World War the French had drop bombs which contained no explosive at all while the airplane was carrying them. Within the bombs were two compartments. One was filled with liquid nitric oxide, an oxidizing gas which liquefies readily and remains liquid at ordinary temperatures when confined under slight pressure; the other compartment contained a combustible liquid, ordinarily either gasoline or carbon disulphide. An enemy bullet striking the bomb would destroy it of course, but would not make it explode. When the bomb was released from the airplane, the little propeller on its nose, actuated by the force of the air during flight, caused a valve to open and the two liquids to mix. The bomb was thus filled with a sensitive and powerful high explosive. The bombs exploded upon impact against the slightest obstacle and were therefore more useful against personnel than for the destruction of buildings, for which purpose a bomb loaded with an insensitive explosive is needed — a bomb which will not explode upon impact with the roof but is exploded by means of a detonator after it has penetrated to the basement.

A recent news dispatch reports that the Spanish Insurgents are using against the Loyalist infantry airplane drop bombs which contain liquid air in accordance with an invention which is said to have been made in Germany. Such bombs would be practical if the liquid air were not mixed with the combustible component of the explosive, either solid or liquid, until after the bomb had been released from the airplane. The compartment containing the liquid air could not, while the plane is carrying the bomb, be kept closed to the outer atmosphere. The liquid air must be free to evaporate in order that it may keep itself at the low temperature. It would have to be introduced into the compartment of the bomb shortly before the bomb is to be used, which would be a time-consuming nuisance in wartime, and the bombs would not retain their vigor for many hours because the liquid air would evaporate away. The effective life of the bomb could, of course, be increased by building the liquid-air compartment after the model of a thermos bottle. It is doubtful whether the tight little bombs which the French used more than 20 years ago would not be better, more convenient, and probably just as cheap.

THE INSTITUTE GAZETTE

PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

The President's Report

IN his annual report to the Corporation on the affairs of Technology, President Compton reviews the operation of the Institute during the past year and, looking to the future, suggests certain changes in educational procedure, poses certain academic problems, and discusses Technology's needs.

The future of architectural education, extension of the coöperative courses, further development of honors courses, an advanced fellowships fund, endowed professorships, student aid, and additional support for research—these are some of the subjects which will be presented in two summaries of Dr. Compton's report to be published in *The Review*. The first of these follows; the second will appear next month.

SCHOOL OF ARCHITECTURE

There is special interest at this time in the future program of the School of Architecture. Internally, it has now come again into intimate contact with our other Departments, after 22 years of enforced separation following the transfer to Cambridge of all other Departments. Externally, the architectural profession has been subjected to the simultaneous stresses arising from greatly decreased activity during the depression, technological changes in building methods and materials, and new social requirements. There are indications that these stresses will make considerable changes in architectural practice and therefore also in architectural education, although it is perhaps premature to predict what these changes will be.

The central theme of all good architecture is design, which provides for the efficient functioning of the building in a manner which is artistically pleasing and technically appropriate. Modern development of new building materials and methods, combined with social and economic pressures, is creating new demands on the architect and presenting new opportunities for him. Thus, while the central theme remains unchanged, the techniques of its application must continually adapt themselves to the evolution of the technical and social environment.

Now that the School of Architecture is again a closely integrated part of the Institute, it has new opportunities to meet the requirements of this situation. While still maintaining in its program continual emphasis on the central importance of design, it now has a wealth of opportunity for students and staff alike to secure instruction, criticism, or advice from experts in related fields.

Consider for a moment the striking quality of these opportunities. Immediately adjacent to the new quarters of the School of Architecture

are located our strong divisions of Building Engineering and Construction, and of Heating, Ventilating, and Air Conditioning. A walk of 30 seconds farther along the corridor brings us to the offices of the Bemis Foundation, newly established for research on shelter. Then, after Naval Architecture, is located the work in civil engineering structures, materials testing, and sanitary engineering. After passing this we come to the Department of Economics and Social Science, which has given considerable attention to the economics of housing. Going down the corridor in the other direction we come quickly to Public Health Engineering, Acoustical Engineering, and Illuminating Engineering.

The importance to architecture of these related activities needs no amplification. The staff in Building Engineering and Construction specializes in building materials, building methods and construction, and job management, while the Albert Farwell Bemis Foundation was established as a clearinghouse for up-to-date information on materials and methods of house construction, and to foster research in these fields. The opportunities afforded to the School of Architecture do not flow in one direction only, for, conversely, the architectural group can be of continual aid and stimulation to these other colleagues.

It seemed clear to Dr. Compton, therefore, that the great opportunity, which is now open to us as to no other school in the field of architectural education, lies in a course of training which retains the central theme of design and at the same time gives the student some



M.I.T. Photo

THE DEWEY LIBRARY

... dedicated last June to Dr. Davis R. Dewey, beloved Professor of Economics for over 40 years, now Professor Emeritus. Serving Economics, Business Administration, Civil Engineering, and the Labor Relations Section, this new library efficiently utilizes the inadequate lecture hall, unhappily known to past students as 5-330

knowledge and some discipline in these related features of a modern structure which are requiring more and more consideration by architects. There should be a great field for young architects who, in addition to competent training in design, have some firsthand knowledge of building materials and construction methods adapted to economy and other practical requirements — even though the technical details may be left to subsidiary specialists.

Accepting the central theme of good architecture as design, which provides for the efficient functioning of the building in a manner artistically pleasing and technically appropriate, Dr. Compton recommended that the Institute proceed to capitalize and coördinate as effectively as possible our existing strong programs in design and in the various technical aspects of construction and equipment of buildings.

Dr. Compton also reported that Dean Emerson is not only in agreement with this program but had anticipated Dr. Compton's own expression of opinion by suggesting the same line of approach. Dean Emerson has already taken some initial steps to make this program effective in our new setting. In speaking of him, Dr. Compton paid sincere tribute to his able and devoted leadership of the School of Architecture during a period in which coöperation with other Departments was practically impossible because of the physical separation of the parts of the Institute, as well as during the recent period in which the effects of depression were more severely felt by architects than by any other one of our professional groups. Early foreseeing the trends, he quickly and energetically set about the establishment of our new Course in City Planning. Recognizing that training in design has wider applications than just to buildings, he has successfully directed the attention of many of our students to opportunities in the design of industrial products.

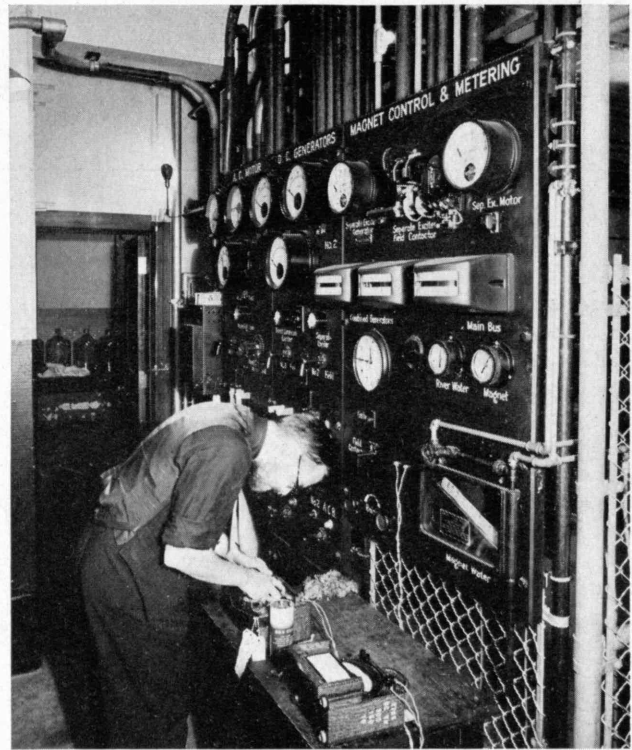
The Placement Bureau of M.I.T.; Its Policies and Services

BY NATHANIEL McL. SAGE

Placement Officer

SOONER or later the services of the Institute's Placement Bureau become a matter of immediate interest to almost every Alumnus whether he himself needs help in advancing his career or seeks the services of a competently trained man for his firm or company. In either case it is the desire of the Placement Bureau to coöperate in a fair and impartial manner in assisting the properly qualified man to the appropriate position or to find a position for which the Alumnus is suited by training and personality.

While the Bureau is active in aiding students to find positions, as I shall describe later, assistance to Alumni occupies a major part of its program. Toward this end it maintains an Available List and, for each Alumnus on this list, an adequate personnel record containing information on business experience and qualifications. As inquiries from industry are received, those men who seem to fit the specifications set by the employer are



M.I.T. Photo

THE CONTROL PANEL

... in the new magnet substation now in operation, whereby is regulated the flow of electricity which energizes and the water which cools ...

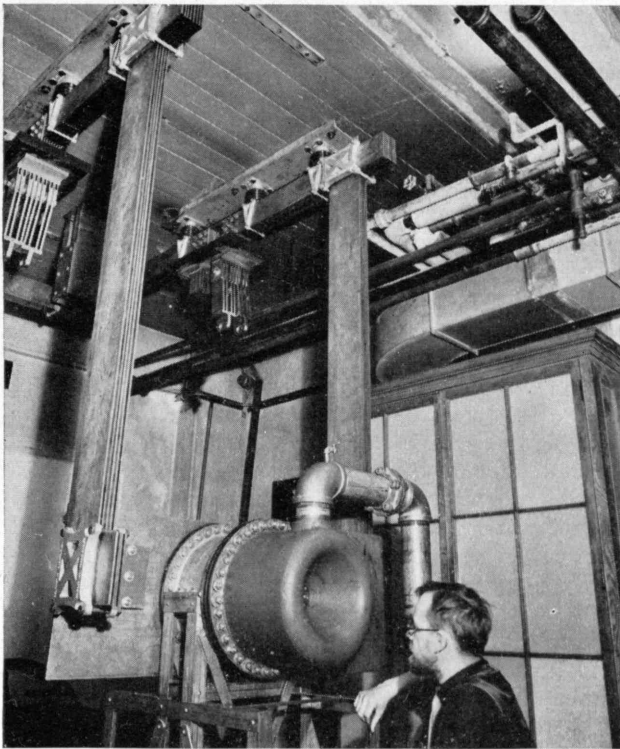
selected, and their records are then transmitted to the employer who in turn makes contacts with the candidates whose records interest him.

Because the Bureau feels that it must operate in a fair and impartial manner and that the elimination of all questions of fees would help to insure its doing so, no charge whatsoever is made for placement service.

It should be clearly understood by everyone that the function of the Placement Bureau is not to make a contented employee discontented with his position. Its function, rather, is to assist Alumni who find themselves in a blind alley and need help and to aid the able men who are ready for advancement but who, because of some special situation, cannot go forward with their present employers.

The following figures give some idea of the activity of the Placement Bureau during the year 1937: 4,336 letters received; 803 men placed on the active list; 556 men taken off the active list; 163 interviews with employers; 2,173 interviews with Alumni; 1,057 openings brought to our attention; 2,240 recommendations made.

In the school year 1937-1938, we had 955 industrial openings running from a recent graduate with a year or two of experience to major executives, with salary ranges to correspond. More than 3,000 recommendations were made. It is not possible to report on the percentage of success because a good many of the negotiations are still in process and also because a considerable number of men who have been assisted neglect to report their success when they secure positions.



... THE MAGNET

... *wherewith Professor Francis Bitter, seen in both pictures, secures steady magnetic fields of unparalleled strength to aid research in spectroscopy, chemistry, metallurgy*

Two factors determine how effective the Bureau can be to the individual Alumnus: (1) the excellence of the individual's record and (2) the marketability of his experience.

An Alumnus should remember that, regardless of his feelings as to how good he is, this feeling must be shared by others before it will be accepted by a prospective employer, with the monthly transfer of hard cash that goes with such acceptance. Marketability of experience is a picture that changes from year to year. For instance, for a number of years we have been of little assistance to structural designers and civil engineers. In September and October of this year we received more demands for junior-grade engineers in these categories than we have been able to fill.

The Placement Bureau has no power over the granting of jobs. Its function is to submit qualifications and get the interested parties introduced. The helpfulness of the Bureau to the alumni body depends on the soundness of the Bureau's recommendations. For that reason we cannot afford to gild the lily. There have been numerous cases where the work of the Placement Bureau has been ineffective because of the sketchy and inadequate records supplied to us. These instances have, of course, been corrected, but the fact that we found some makes us feel that there are undoubtedly a good many more.

There have been other instances where what might be termed a blown-up experience record has created such a feeling of uncertainty as to a candidate's sound judgment that the Bureau has been afraid to operate

in the man's behalf. Out of fairness to yourself, give us a clear and accurate picture; out of fairness to the Institute, don't overstate it. If the Alumni could have the feeling that the Placement Bureau is a friendly and impartial place to come for help, it would be of material assistance to both parties.

Engineers are proverbially poor purveyors of their own abilities. We have been able to assist many men in the preparation of their experience records and in giving advice on other markets to contact. As a result of this, many have placed themselves before the Bureau had an opportunity to operate in their behalf. We are of frequent assistance to Alumni who are beginning to be troubled about where they stand. Is their remuneration or are their responsibilities in line with their age and experience? In these cases we give such information and advice as the situation warrants — sometimes a good deal, but sometimes we have to confess that we are stumped.

AID TO STUDENTS

The placement of the about-to-be graduated is handled by each of the 19 Courses, working with the Placement Bureau. The Institute's annual production is between 500 and 600 individuals. In 1937, a banner year, 1,416 interviews were held in the Placement Bureau from January through April. The total for all interviews held at the Institute would be much higher. Frequently a company interested in men from a single Course will hold interviews in that Course headquarters, and these interview figures are not included in the figure quoted above. The selection of men for interviews is very largely in the hands of the Course placement officers. All 19 Courses have one or more placement officers who devote a very considerable amount of time and energy to the proper placement of their men. The arranging and scheduling of most of this work falls on the Placement Bureau. Better than 300 qualification records are forwarded each year to companies who make contact by mail rather than by person. In all this work every effort is made to prevent any misunderstandings that might arise concerning either the jobs or the qualifications of the applicants.

As part of this program of student placement the Bureau sponsors, in coöperation with the Courses, a series of lectures on placement training. In these lectures industry has generously coöperated. They have proved exceedingly helpful in familiarizing students in the proper way to prepare and present themselves for appropriate positions.

The Placement Bureau welcomes the opportunity afforded by the Alumni Association to make this statement about its services and policies and to thank the many Alumni who have given helpful coöperation and advice and who have been alert in notifying us of openings.

How Aeronautics Started at the Institute

INTERESTING documents have recently come into our hands relating to the efforts which began in 1909 to start courses in aeronautical engineering at the Institute. In the spring of that year the Alumni Council, then newly formed and ardently anxious to prove its

worth, did so very neatly by appointing a committee to study the advisability of setting up an aeronautics course at the Institute and the ways and means. The committee appointed included Henry Howard, '89, chairman, the late Henry A. Morss, '93, and Butler Ames, '96, then a member of Congress.

The committee was informed of its appointment on June 15, 1909, and that it went promptly to work is demonstrated by this letter:

THE WHITE HOUSE
WASHINGTON

June 24, 1909.

My dear Mr. Wright:

This will introduce to you Mr. Henry Howard, of Boston, a gentleman of standing in that community whom I have known in connection with the Eastern Yacht Club and who is interested in aeronautics. He has induced the Boston School of Technology to prepare for the adoption of a course in aeronautics in its curriculum, and he is very anxious to talk to you in the matter and interest you and your brother as the chief and most advanced representatives in this science. Any time that you are able to spend on this matter I shall highly appreciate.

Very sincerely yours,

(Signed) Wm. H. Taft

Mr. Wilbur Wright,
Washington, D. C.

Apparently the committee hoped not only to get advice from Wilbur Wright but to induce him to come to the Institute. That Dr. Maclaurin had also considered this is indicated in a letter to Mr. Howard describing correspondence that he had had with Wilbur Wright.

During the summer of 1909, Henry Morss was traveling around the world, and Henry Howard prevailed upon him to visit those institutions where aeronautics had been recognized, and this Mr. Morss did. In one of his letters Mr. Morss speaks of trying to see one Professor Prandtl in Germany, who unfortunately was away on vacation. This Prandtl, then a young man, was destined to become one of the most distinguished of aeronautical engineers, and it was appropriate that he should have been present at the dedication of Technology's new wind tunnel last September.

The result of the committee's work and enthusiasm was the following report to the Alumni Council, dated April 28, 1910: "The Committee appointed by the Council of the Alumni begs leave to submit the following report:—

"First: We believe that the present state of the art of Aeronautics is such that the Institute of Technology should start a course in this subject with the least possible delay.

"Second: As a necessary adjunct to this course we believe that suitable research equipment should be installed. Attached hereto is a blue print of a possible lay out prepared by Professor Lanza. The approximate cost of such an installation complete with the necessary weighing and measuring apparatus and a small room over the end of the large pipe is \$10,000. This equipment will furnish a current of air 11 ft. square, moving at a

rate of 60 miles per hour and includes a 300 horse power motor of 2300 volts which would be driven by Professor Lanza's turbin generator set, the current of which is now only used for boiling water.

"Third: We recommend that the council of the Alumni bring this matter to the attention of the proper authorities at the Institute and that, if our recommendations receive their approval, either our committee or some other committee be authorized by the Institute officials to raise the necessary money for carrying out the foregoing recommendations and such others as may be considered necessary for the proper development of a course in Aeronautics."

So far so good. But the eddy which caught up all of these efforts and kept them helplessly circling was the \$10,000 which apparently the Institute could not appropriate and the committee could not raise. The committee kept battering away. They were rewarded in 1913 when Jerome C. Hunsaker, '12, then a young naval officer, was detailed to the Institute and was destined to organize the first aeronautical engineering course and build the first wind tunnel. He was destined, too, as we hardly need to say, to direct the building of the latest wind tunnel, as he now is in charge of the Course in Aeronautics.

Visiting Committee Reports

IN view of the interesting origins of the Course in Aeronautical Engineering described above, it is appropriate below to cap that history with the equally interesting and most recent report of the Institute's Visiting Committee for this Course. We likewise present the report of the Committee on the Department of Modern Languages.

COURSE IN AERONAUTICAL ENGINEERING*

THE first matter on the agenda was enrollment. The limited space will accommodate only about 30 to 35 students in each of the three upper classes. Freshman enrollment in 1936-1937 was 87, but only 30 were selected to continue. Graduate enrollment grows slowly, increasing from 39 to 51 over a three-year period.

The aviation industry can absorb more first-class men. The transportation of passengers, freight, and express through the air is the only major industry, excepting gold mining, that has shown an increase every year from 1926 on, and the ratio of increase has been enormously greater than that of gold mining. The Committee favors a gradual expansion at a rate of about ten per cent a year in the number of undergraduates in this Course and the provision of facilities necessary for this increase.

On our visit to the Institute, Professor Hunsaker, '12, explained that the 7½-foot wind tunnel was not up to date and would be removed from its present building. The space now occupied by this wind tunnel is three stories in height, and to extend one of the floors in the adjacent building clean across this space would not be a

* Members of this Committee for 1937-1938 were Godfrey Lowell Cabot, '81, Chairman, B. Edwin Hutchinson, '09, Edgar S. Gorrell, '17, Donald W. Douglas, '14, the late Franklin A. Park, '95, Theodore P. Wright, '18, and George W. Lewis.

difficult matter. The room thus obtained could be used for a draughting room or for some other purpose connected with instruction in aeronautics. If the increase in running expense did not exceed the annual income from tuition fees, this proposal of Professor Hunsaker would seem to justify itself.

The investment of the funds of the Institute for revenue is exceptionally puzzling at this time because, on the one hand, we are threatened with a further decline in the value of the currency in which bond interest is paid, and, on the other hand, the business depression and possible economic changes in the future make it difficult to select stocks whose future is reasonably secured. Therefore, for a moderate sum, an increase in the plant of the Institute would seem to be a reasonable proposition, particularly if the needful funds can be obtained through the generosity of the Alumni, as will probably be the case in this instance.

The second matter discussed — whether the present language requirement of German should be cancelled — was laid on the table. The general opinion of the Committee was that the omission of German would be unwise.

The Committee approves the present policy with regard to gliding and flight training. The students who are active in this, that is, in actual gliding, are subject to their parents' consent but are otherwise left untrammelled. This sport is receiving a very great and increasing support in most European countries, where considerable sums of money are appropriated out of national funds to encourage it. Remarkable achievements have resulted, particularly in Germany, in sustained flight, in height attained, and in distance traversed without use of a motor. For testing gliding endurance, the usual practice is to soar over a particular area where there is an upward component of velocity in some prevailing wind rising over an upward slope, and the European records have far exceeded 30 hours. Our United States record is over 24 hours. For height, the upward currents generated on comparatively calm days in hot countries seem to be particularly suitable, and for distance, these upward currents have likewise been largely utilized. When one local upward current begins to weaken, the practice has been to glide to another upward current, identified by the pilot by the appearance of a cumulus cloud, which always marks the capital to a rising column of warm air. Thus by using these rising currents as steppingstones, remarkable distances have been achieved in gliding flight.

The use of the word "obsolete" with regard to the 7½-foot wind tunnel indicates, in this instance, that the tunnel no longer deals with air speed anywhere nearly as great as the speed at which commercial flight is usually conducted in this country, and while undoubtedly useful for teaching, this wind tunnel is not of much value in assisting present practice and giving advice to aircraft manufacturers on their new models.

With regard to the Institute's boundary-layer wind tunnel and the multistage wind tunnel, experiments have shown that skin friction and expenditure of power caused thereby are partly determined by whether a smooth surface allows the air to slip over it in a steady stream without eddying or whether, by some improper conformation or shape of the surface, the surface layer

of air diverges from the surface over which it is passing and causes an eddy. Well-conceived experiments prevent the adoption of surfaces and shapes which show the latter undesirable characteristics under normal flying conditions. In the multistage wind tunnel, for instance, there are four diameters. The air entering at the large end is conducted into three successive contractions over a smooth curved surface having the general characteristics of a Venturi tube. Recently in the handling of natural gas in large quantity, the use of especially made valves, at which the entrance and the exit are curved and streamlined, has shown that a valve much smaller than the pipes on either side connected by it can be used with negligible increase in the resistance to the passage of the gas, just as in the Venturi tube. In fact, this is a special adaptation of the Venturi tube, where the energy lost in speeding up the air to pass through the narrower part of the tube is regained with very little ultimate loss as the speed of the air slows down again in entering into the expansion on the other side of the bottleneck.

The Committee next discussed the new up-to-date tunnel at the Institute, for which funds were contributed two years ago. Tests made two or three years ago with the great wind tunnel at Langley Field showed that by having speed tests with an air speed approximating the commercial practice in this country, which is considerably greater air speed than in Europe in commercial practice, and by using air at a high pressure, it was possible, with small models, to get close approximations of the results that would follow precisely similar shapes of commercial size. For instance, a certain English model gave results in actual practice 20 per cent different from the calculations in an English wind tunnel on the small model. This same small model tested in the high-pressure tunnel at Langley Field gave calculations within two per cent of the actual result. The new tunnel at M.I.T. is intended to bring the Institute up to date in such investigations. It can also be used down to 25 per cent of sea-level atmospheric pressure, thus imitating the density of the atmosphere at about seven miles vertical height, which is far above any height yet used in commercial practice, though by no means as high as the extreme record. At this height the miles per hour indicated on a Pitot tube gauge must be multiplied by two to give the actual speed of the airplane, which suggests the *raison d'être* of the supercharger that has made possible with a given horsepower the attainment of much higher speeds at great heights than at sea level. The Committee feels that the new wind tunnel should be used for about half the time on research work for M.I.T. and when not thus used should be available for projects of interest to the aircraft industry.

DEPARTMENT OF MODERN LANGUAGES *

IN submitting a report to the Corporation on the work of the Department, the Committee thinks it worth while to begin by outlining its conception of the broad aspects of the problem of (*Continued on page 92*)

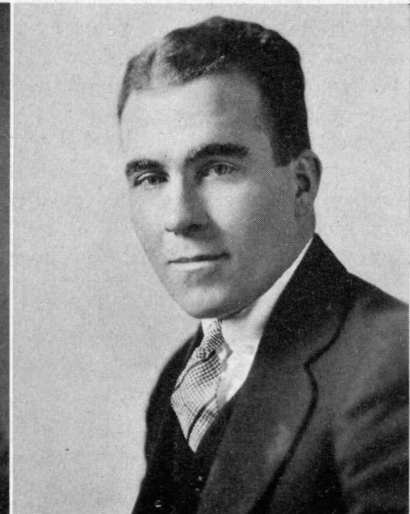
* Members of this Committee for 1937-1938 were James M. Barker, '07, Chairman, H. Daland Chandler, '08, the late Francis R. Hart, '89, Arthur T. Hopkins, '97, John E. Aldred, Christian Gauss, and Robert E. Rockwood.



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*J. Rhyne Killian, Jr., '26, Editor of
The Review Resigned*

*Frederick G. Fassett, Jr., Editor of
The Review Elect*

*Ralph T. Jope, '28, Treasurer of the
Alumni Association Elect*

“As of December 31”

AFTER the publication of the January Review, J. Rhyne Killian, Jr., '26, relinquishes the editorship, which post he has graced so admirably since 1930, to become Executive Assistant to President Compton; and with the following issue The Review's eighth Editor, Frederick G. Fassett, Jr., will make his initial bow and blush. By vote of the Executive Committee of the Alumni Association, Ralph T. Jope, '28, in addition to his duties as Business Manager of The Review, becomes Treasurer of the Association, an office which Mr. Killian has held since 1929. Technically, the transmission of portfolios in each instance will occur as of midnight of December 31.

Professor Fassett is already favorably known to readers of this magazine, for in its columns there have appeared a number of articles signed by him, and since 1935 he has been one of the most vigorous of our corps of Contributing Editors, in which capacity the output of his pen has been prodigious, though anonymous, in the Trend of Affairs section.

A graduate of Colby College, a former newspaper writer, and sometime teacher at the University of Maine, he joined the Institute's Department of English and History in 1930. Since then he has advanced to the grade of associate professor, and he has acquired an especial reputation for the classes in composition which he has conducted on behalf of candidates for the undergraduate publications. As a member of the Alumni Advisory Council on Undergraduate Publications, he has also commanded the respect of the upperclassmen concerned with the management of these publications, many of whom have carried over from their freshman days indelible memories of the pains and patience Professor Fassett displayed when endeavoring to persuade them to fore-swear dangling participles and to overcome a youthful fondness for sentences that could not be parsed.

Readers of The Review will be equally interested to know that Professor Fassett comes to the editorship as

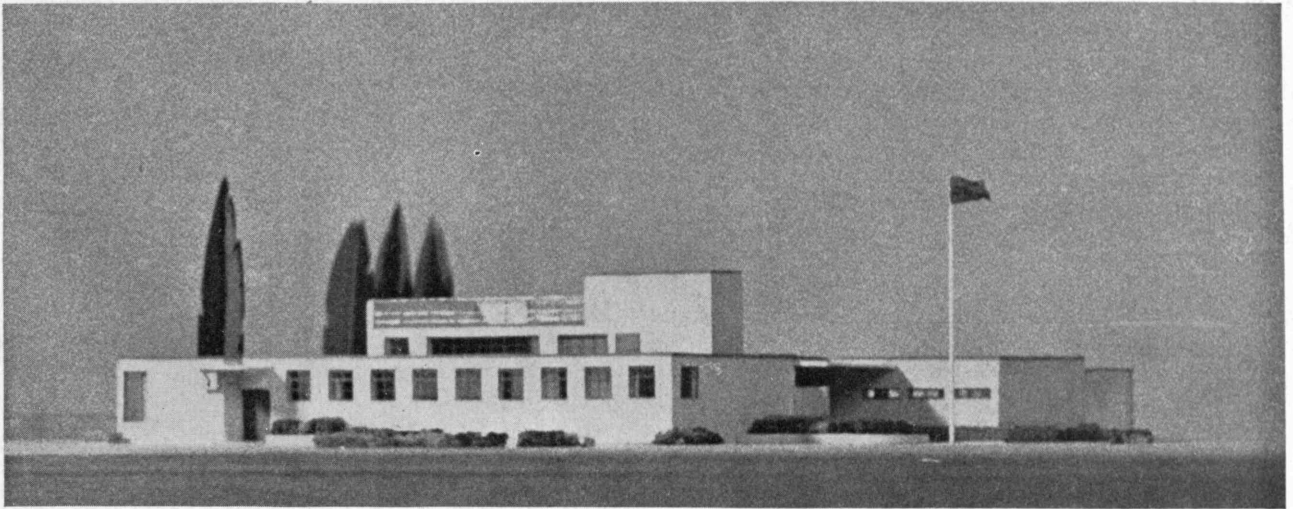
the unanimous choice of Mr. Killian, Mr. Jope, and myself — and that he was our first choice.

By coincidence our next issue marks the 40th anniversary of The Review, which began as a quarterly with its Vol. I, No. 1, dated January, 1899. For 12 of these 40 years Mr. Killian has been a part of The Review, and during the last eight years — the most recent fifth of the magazine's history — primary responsibility for its editorial destiny has been his. It is but a simple statement of fact, and in no sense a reflection upon his predecessors, to record that during Mr. Killian's editorship circulation has risen to hitherto unprecedented levels, and this, parenthetically, has strengthened the hands of Mr. Jope who, as Business Manager, saw to it that advertising records were broken concurrently with rises in the numbers of Review readers. Mr. Killian's present associates on The Review — and Professor Fassett — therefore derive considerable comfort from the thought that Mr. Killian's name will not disappear from the masthead after the next issue, for although he will not be The Review's principal Editor, he has consented to become a Contributing Editor.

President Compton has announced that in his new position of Executive Assistant to the President, Mr. Killian will participate in the Institute's administration and will take over some of the responsibilities carried by Vice-President Bush, who, also as of midnight on December 31, becomes president of the Carnegie Institution of Washington. Mr. Killian will also be chairman of the newly created Board of Publications of The Technology Press.

Consequently the entire staff of The Review congratulates Jim Killian without reservation upon his new appointment as an administrative officer of the Institute, and, again without reservation, we congratulate Dr. Compton.

H. E. LOBDELL, *Publisher*



THE CONTRACT HAS BEEN LET

. . . for this new field house to service the new track and playing field west of Massachusetts Avenue. For details of these and other facilities made possible by alumni effort and alumni generosity, see below

When Good Fellows Get Together

The Alumni Fund Campaign: What It Totaled, What It Cost, Who Won, and How It Will Be Used

To Technology Alumni and Friends:

At the outset of this brief report, I wish to record appreciation, in behalf of all who cherish Technology, for the valiant efforts of the 2,000 or more Alumni who worked enthusiastically and effectively to promote the campaign.

In the van of these 2,000 troops stood Marshall B. Dalton, '15, last year's Alumni President; Thomas C. Desmond, '09, Chairman of the Fund Committee; John E. Burchard, '23, Assistant Chairman; and Elbert G. Allen, '00, Director of the Campaign.

If the names of the winning groups in the regional contest are to be permanently recorded in one of the new buildings, the names of the 7,000 or more Alumni, staff, and students who contributed to the fund will be engrossed in the imperdurable pages of Technology's book of progress.

H. B. RICHMOND, '14

President of the Alumni Association

COMBINED efforts of Alumni, students, and friends of Technology, last year, in the Alumni Fund Drive to provide M.I.T. students with improved recreational facilities resulted in the subscription of \$402,234.52 as of June 30. Of this amount, over \$285,000 has now been redeemed and is on deposit in the Treasurer's Office at the Institute. Considering that the pledges were made on the basis of two years to pay, the foregoing result is most gratifying. Further payments are being made daily.

A breakdown of the pledges to the fund, as included in the final report of the campaign manager, Elbert G. Allen, '00, to the Executive Committee of the Alumni Association, gives statistical evidence of the whole-

hearted endorsement of all contributing groups to "build the man as well as the mind" at Technology. A breakdown of the pledges follows:

4,904 Alumni	\$365,419.76
1,783 Undergraduates	24,895.77
199 Non-Alumni Faculty and Staff Members	9,177.50
103 Other Non-Alumni	2,741.49
6,989	<u>\$402,234.52</u>

Alumni subscribers totaled 18.1 per cent of the entire number on the Alumni register for whom good mailing addresses were available. (The register includes the names of all who ever attended the Institute for one term or more.) This average of 18.1 per cent is fairly uniform for all Classes except the older ones, among which — for reason of the small number in each Class — a large variation is found. Classes having been graduated from 30 to 40 years showed a slightly larger percentage of subscription than either older or younger Classes.

The Classes of 1868, 1875, and 1878, had a perfect score, with 100 per cent of the total class membership subscribing to the fund. Other outstanding Classes graduated prior to 1900 were 1870, 1872, 1885, 1891, and 1896 — all of whom showed 25 per cent, or better, of the Class subscribing. Of those graduated after 1900, 1908 is the only Class with subscriptions in excess of 25 per cent of its entire membership.

The laurel wreath of victory to all participating groups on the basis of percentage of group contributing goes to the M.I.T. Faculty and instructing staff with its impressive record of 76.7 per cent of its membership

subscribing \$27,243.49. On a geographical basis, the honor of having the largest portion of its Alumni listed as subscribers goes to East Tennessee (Knoxville) where 68.3 per cent subscribed. In the regional campaign, based on per capita subscription, Wilmington, Akron, Duluth, Vermont, Niagara Falls, Cincinnati, Pittsburgh, Hartford, Montana, East Tennessee, and Oklahoma won in their respective districts.

The average contribution from all groups was \$57.55. The amount of the average alumni subscription was \$74.53. Eliminating the effect of extra-large gifts (those in excess of \$1,000), the average for Classes graduated 20 years or less was approximately \$10, plus \$2.50 for each year since graduation. Half of all subscribers gave \$20 or less; one-quarter, \$10 or less. Half of the fund came from gifts of \$200 or over; one-quarter from gifts of \$1,000 or over.

Although the solicitations to Alumni and friends of Technology stressed the desirability of making pledges to be paid over a two-year period, a large portion of the subscriptions were paid in full. As of June 30, 64 per cent of the subscribed amount had been paid. At the present time, approximately 71 per cent of the fund pledged has been redeemed. The collection cost of the entire campaign was less than 10 per cent of the amount pledged, a cost that compares most favorably with all other campaigns for which figures are available.

While the total amount pledged did not reach the hypothetical goal of the campaign, Technology men may take just pride in realizing that sizable funds are now available for beginning the job of improving the recreational facilities for Technology students.

"How," you may ask, "is this money to be spent?" Dr. Compton, in his address at the alumni banquet last June, stated that the \$400,000 now available was adequate to permit the construction of the following units in the Technology program for improved recreational facilities: (1) New track and revised group of outdoor playing fields on land west of Massachusetts Avenue; (2) construction of an adjoining field house, with lockers and shower facilities on land west of Massachusetts Avenue; (3) erection of a swimming pool and an adjoining unit to provide additional locker space, showers, Athletic Association offices, and equipment rooms on the site of the present track and connected with the present Barbour Field House.

Following this plan of procedure, the Rubien Construction Company of Westfield, N. J., was awarded the contract last August to build the new track, which will be ready for use in 1939. This track has been designed by Frederick W. Rubien, Sr., who worked with the late Major Frank H. Briggs, '81, in building Technology's present track in 1914. Mr. Rubien holds the distinction of having served as secretary of the American Olympic Committee since 1914 and is considered by athletics authorities as *the* expert on track construction in the United States.

Technology's new track will measure one-quarter mile, having a 220-yard straightaway, 28 feet wide. The turns and backstretch will be 20 feet wide; thickness of the track (built of cinders), 18 inches. While constructed for use under the English system of distances, the new track will be permanently marked for metric distances as well.

Construction of the new field house to be built in back of the old Tech Coop, on land west of Massachusetts Avenue, will commence shortly. The plans recently approved include locker facilities for 432 men, three visiting-team rooms (accommodating approximately 30 men each), two coaches' rooms, one officials' room, one rubbing room, and adequate shower, equipment storage, and toilet facilities. A much needed sun deck will be constructed on top of the building.

Designs for the new swimming pool and additional Athletic Association offices are not yet completed. Tentative plans call for the construction, in one building, of a recreational and competitive pool, 75 feet long by 42 feet wide, with a shallow pool, 20 feet long by 42 feet wide, for beginners. This pool unit, together with Athletic Association offices, will be designed so that other athletic and recreational structures may be added and harmoniously related as funds become available.

The Record of the Classes

Class	Per Cent Subscribed	Average Subscription	Average Per Capita
1868	100.0	\$ 15.00	\$ 15.00
1869			
1870	28.6	30.00	8.57
1871			
1872	25.0	250.00	62.50
1873	14.3	1,000.00	142.80
1874			
1875	100.0	14.06	14.06
1876	23.1	340.00	78.50
1877	8.7	17.50	1.52
1878	100.0	19.38	22.14
1879	4.0	10.00	.40
1880	6.7	150.00	10.00
1881	22.2	195.83	43.50
1882	7.7	150.00	11.54
1883	16.7	44.00	7.33
1884	17.4	225.25	39.30
1885	28.3	56.65	16.04
1886	14.6	177.58	25.99
1887	21.4	160.65	34.30
1888	17.9	125.58	22.49
1889	13.3	250.13	33.20
1890	16.9	134.80	22.83
1891	25.5	67.86	17.30
1892	17.2	217.30	37.47
1893	20.6	114.50	23.58
1894	14.6	342.77	50.03
1895	23.0	187.13	42.90
1896	26.1	180.84	47.12
1897	18.5	395.80	73.36
1898	21.5	98.41	21.14
1899	16.0	169.90	27.18
1900	16.8	92.60	15.54
1901	21.2	648.32	137.60
1902	19.3	106.50	20.57
1903	21.8	75.69	16.53
1904	16.3	90.97	14.82
1905	17.9	151.60	27.07
1906	22.0	113.58	24.98
1907	21.2	180.40	38.30
1908	25.8	54.84	14.16
1909	18.0	118.16	21.23
1910	19.3	79.30	15.28
1911	21.6	80.00	17.30
1912	20.5	80.25	16.41
1913	19.8	79.63	15.79
1914	21.9	91.95	20.69
1915	18.0	82.39	14.84
1916	19.3	125.97	24.29
1917	17.9	70.54	12.63
1918	14.3	57.90	8.28
1919	16.0	46.45	7.42
1920	17.0	71.64	12.15
1921	15.4	46.64	7.17
1922	18.4	47.24	8.70
1923	16.9	43.42	7.34
1924	17.6	58.58	10.29
1925	13.4	34.57	4.64
1926	22.4	41.23	9.23
1927	18.5	32.40	5.99
1928	22.2	38.28	8.49
1929	15.4	29.00	4.45
1930	14.8	26.41	3.91
1931	14.4	26.90	3.87
1932	14.7	16.26	2.39
1933	18.4	23.10	4.26
1934	18.5	20.61	3.82
1935	17.5	18.29	3.20
1936	18.0	16.28	2.93
1937	16.2	13.90	2.24
All Classes	18.1	\$ 74.53	\$ 13.45

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with Portable Grinders . . .

*A Cost Cutting
NORTON WHEEL*

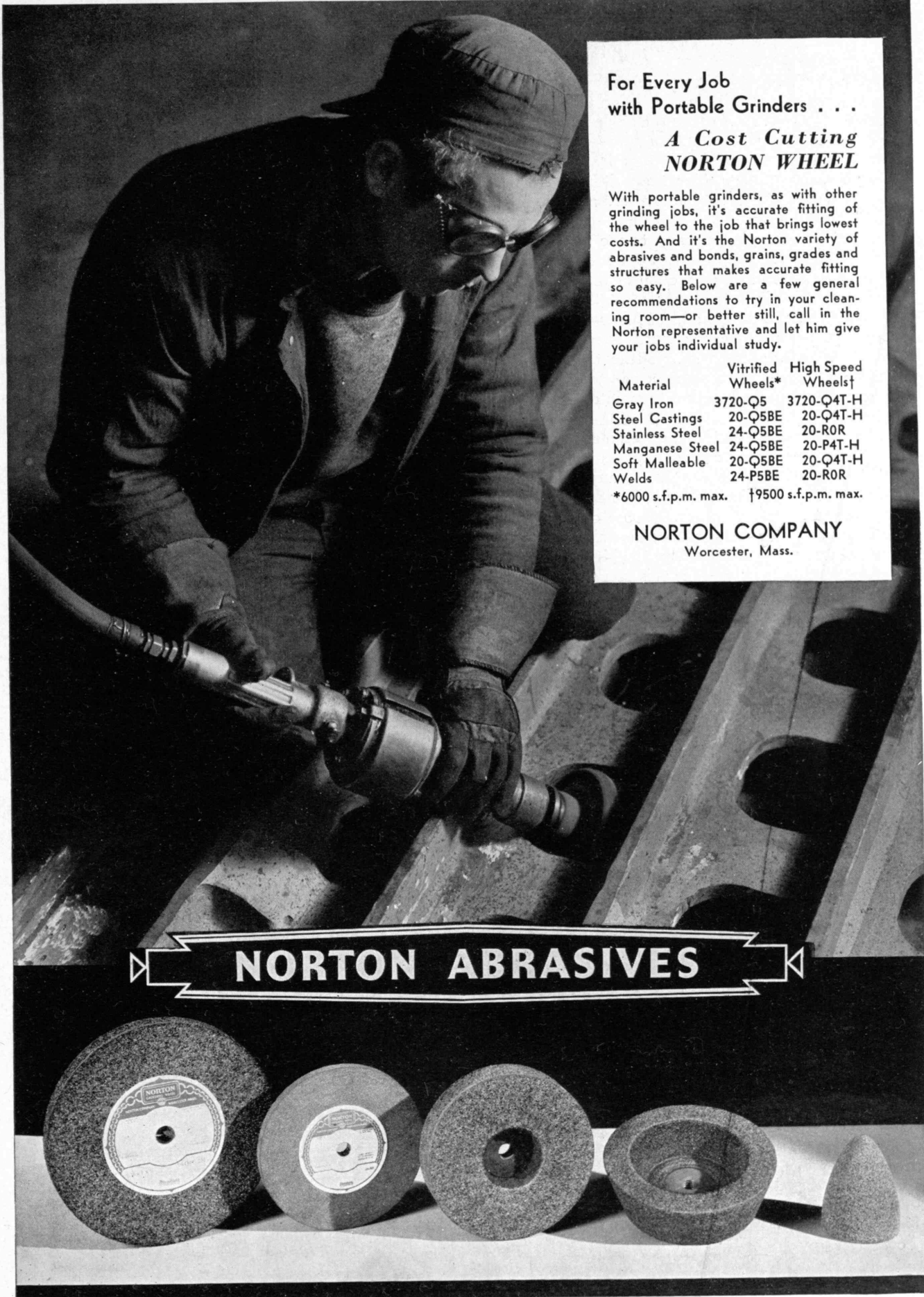
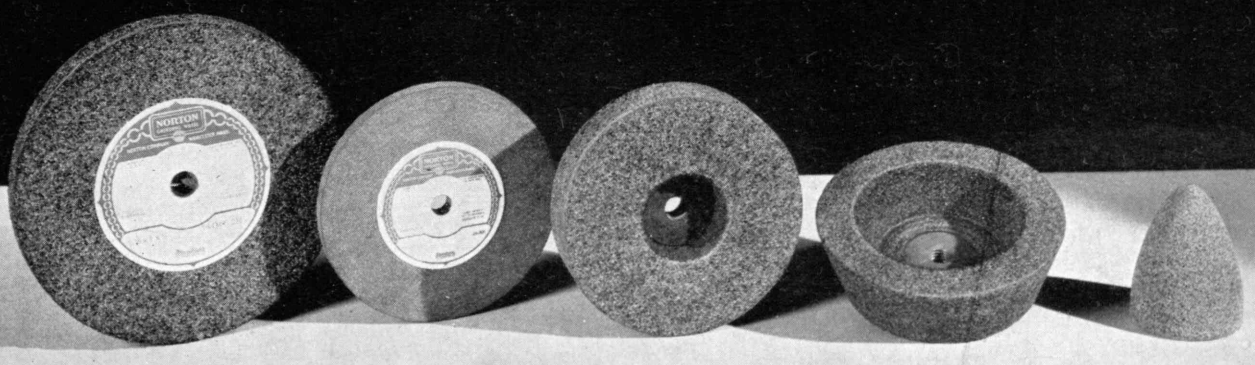
With portable grinders, as with other grinding jobs, it's accurate fitting of the wheel to the job that brings lowest costs. And it's the Norton variety of abrasives and bonds, grains, grades and structures that makes accurate fitting so easy. Below are a few general recommendations to try in your cleaning room—or better still, call in the Norton representative and let him give your jobs individual study.

Material	Vitrified Wheels*	High Speed Wheels†
Gray Iron	3720-Q5	3720-Q4T-H
Steel Castings	20-Q5BE	20-Q4T-H
Stainless Steel	24-Q5BE	20-R0R
Manganese Steel	24-Q5BE	20-P4T-H
Soft Malleable	20-Q5BE	20-Q4T-H
Welds	24-P5BE	20-R0R

*6000 s.f.p.m. max. †9500 s.f.p.m. max.

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NORTON ABRASIVES



NEW DEMANDS ON TECHNOLOGY

(Concluded from page 79)

holds a monopoly, for then are absent those incentives of struggle for survival and ambition for success. It is then easy to fall into a "public-be-damned" attitude, or to be content with the *status quo* — forgetting that law of nature so well expressed by Francis Bacon 300 years ago: "That which Man altereth not for the better, Time, the great Innovator, altereth for the worse."

Thus, for example, it seems to me that by far the greatest merit in the Sherman Antitrust Law of this country lies not in its protection of the public against exploitation by industrial trusts but lies rather in its protection of the public and of industry itself against the dangers of complacency which lead to stagnation of industry. By maintaining competition there is insured a continuing incentive to progress and to ever improved service of the public, and thus to maintenance of virility in industry itself.

For reasons such as these, government monopoly or extensive government control appears to me to be the greatest of all possible dangers to any country, even though it may be possible for such control to be, for a time, efficient and vigorous. All the dangers of complacency and stagnation which are inherent in an industrial monopoly are raised to the highest degree in a government monopoly — for this represents the maximum protection against competition and the minimum of inducement to continual progressive policies.

In this problem of management, whether on an industrial or a governmental scale, there seem to be certain basic principles of wise action: First, minimize the danger by avoiding monopolistic control; second, hold rigidly to the cardinal principle of providing always the best possible service to the public; third, keep continually in mind the lesson taught by science — that there appears to be no limit to the progress possible through sustained intelligent effort.

My final suggestion of a principle of management is the outgrowth of my contacts as a scientist. Experience has amply demonstrated a fact that at first sight seems surprising. It is that the most significant technological advances have not come from direct efforts to make them, however well organized, but as unexpected by-products of scientific work undertaken for quite other objectives — usually for the satisfaction of scientific curiosity. Organized, directed effort is very effective in perfecting the details of a product or its production, but not in its initial discovery. This contrast is greater the more epoch-making is the new discovery.

The logical reason for this is not hard to understand. Really epoch-making discoveries are relatively unpredictable in advance. The practical solution to a difficult problem may come from any one of a multitude of directions. Really new ideas do not come to order and are not pulled out of a hat, and who can tell in whose brain they will germinate. If an industrial research laboratory had been established a century ago to improve lamps, it would have investigated inflammable oils and gases, wicks, chimneys, and refractories. Not conceivably would it have paid attention to the leakage

of electric charges through the air or to the behavior of magnets, wires, acids, and the legs of frogs. Yet from these actually came the modern lighting devices.

I believe that the same logical and psychological principles operate in the field of management generally. A highly centralized and organized form of management may be very effective in performing the specific functions assigned to it in the manner stipulated by headquarters, but it is not a favorable type of organization in which to take advantage of the potential genius inherent in the group which, if given opportunity, may produce better leadership, develop more advantageous objectives and more effective operations.

So I believe that experience, logic, and human psychology all support the view that that type of management is most likely to be successful in the long run which directs and inspires but does not too rigidly control, which offers large opportunity for initiative and for criticism, which has faith in the mass judgment of an intelligent group and in the genius which may appear in unexpected quarters. It is qualities like these which are basic to the type of management which has found favor and success in this country, in the home, in business, and in the organization of our government itself.

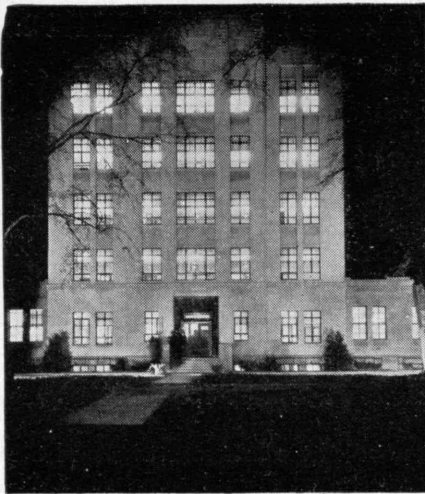
HIGHER HIGHWAYS FOR TOMORROW

(Continued from page 73)

blow account of the months that lay between the final specs and the emergence of the finished article. Suffice it to say that in the spring of 1937 the Air Corps took delivery of a modified Lockheed Electra which is carried on the records as the XC-35 airplane. It differs from the standard Electra mainly in that its fuselage is circular in cross section (for obvious reasons). Construction is conventional except that very careful attention was paid to sealing all joints and openings. Fore and aft, it contains two compartments, either or both of which may be pressurized.

The power plant of XC-35 consists of a pair of 550-horsepower Pratt and Whitney Wasp engines, equipped with turbosuperchargers. Each exhaust-driven turbine wheel carries two impellers on a common shaft, one to supply air to the engine carburetor, the other to supply air for cabin supercharging. For experimental purposes, the cabin superchargers may be used either in series (for wider pressure range) or in parallel (for greater capacity). With this arrangement it has been found possible to operate the airplane at 30,000 feet with a cabin-pressure equivalent of 10,000 feet or less. Under such a condition the differential pressure, inside to outside the fuselage, is of the order of 5.5 to 6 pounds per square inch.

Plenty of "bugs" emerged when XC-35 was in the shakedown stage. Minute leaks in the shell had to be run to earth and calked. Then, at high altitudes and low temperatures, persistent ice formation inside and outside windows made pilotage difficult. Strange and unexpected troubles turned up with instruments, in hydraulic accessories systems, and in engine and propeller oil systems, due to long exposure to extreme cold. But one by one such troubles are being licked. Major Greene and Captain Alfred H. (Concluded on page 92)



Cooperative GLF Office Building Ithaca, N. Y.

NEW GLF BUILDING GETS MODERN HEATING

American Warming & Ventilating Co. Installs Webster Moderator System

Concealed Webster Radiation

Ithaca, N. Y.—Built during 1936, the modern, five-story office building of the Cooperative Grange League Federation stands as a tribute to the careful planning and sound business management of the Cooperative officials.

Working on a limited budget, officers of the GLF sought long life and low maintenance cost in selecting equipment.

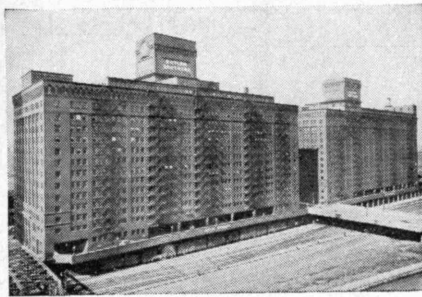
Study of the performance records of Webster Systems of Steam Heating in scores of installations convinced Grange officials that the Webster Moderator System was the soundest possible investment for the heating of their new building.

The Webster Moderator System provides balanced heating service. Heat is delivered continuously to all radiators and the entire building is comfortably heated regardless of the severity of the weather and without overheating in mild weather. Heating costs are held continuously at a minimum.

The installation includes 70 concealed Webster System Radiators. The grilles of these "out-of-the-way" concealed radiators harmonize with the modern interior and increase available floor space. All cast-iron radiators used in the building are equipped with Webster Three-Point Valves to insure maximum flexibility.

Two Webster Boiler Protectors guard against accidental low water in the low-pressure heating boilers. If water is lost from a boiler accidentally, the Webster Boiler Protector automatically maintains emergency level and provides the operator with definite indication that water has been lost.

The Webster System was installed in the GLF Building by the American Warming & Ventilating Co., well-known heating contractors of Elmira, N. Y. The building was designed by Arthur N. Gibb, a leading Ithaca architect.



Butler Brothers, Chicago, Ill.

BIG MODERNIZATION JOB BY WILLIAM LEES, INC.

Heating Changes Completed in Short Time Effect Big Saving For Chicago Building

USE 8-ZONE WEBSTER SYSTEM

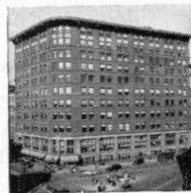
Chicago, Ill.—The heating installation in the great central warehouse and office building group of Butler Brothers Store was modernized during the early fall of 1935. The previously uncontrolled heating system was orificed throughout to balance distribution and placed under control of an 8-zone Webster EH Moderator System. This number of zones was necessary to provide for different conditions of occupancy and the needs of different tenants as well as the requirements of Butler Brothers own operations.

This modernization program, one of the largest central control heating installations ever made, was completed in a remarkably short time by William Lees, Inc., prominent Chicago heating contractors. The fall and winter of 1935-36 served as a period for adjustment and perfection of operating procedure.

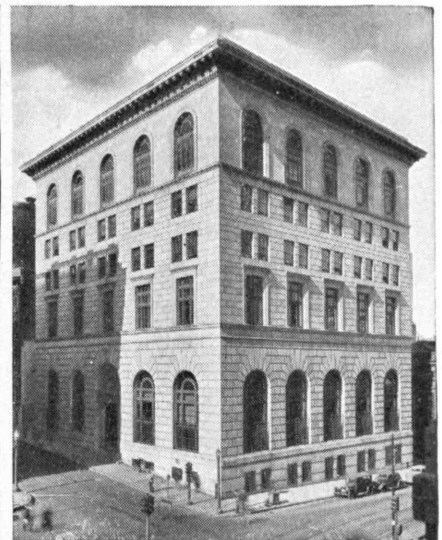
An idea of the savings possibilities is afforded by the record for five months during this adjustment period, from January to May, 1936, inclusive. During this period a measured savings of 420.16 tons, equivalent to \$1218.46, was attained.

Under the contract covering the modernization program Butler Brothers reserved the option to permit payment to be made out of current monthly savings as made, or to complete payment for cash. It is significant that with this privilege Butler Brothers elected to complete payment for cash early in the second season of operation.

A similar modernization program has since been carried out in the Baltimore warehouse building of Butler Brothers, with the Baltimore Heat Corporation acting as Modernization Heating Contractors.



Butler Brothers Baltimore, Md.



Baltimore branch of the Federal Reserve Bank of Richmond, Baltimore, Md.

COMPLETE MODERNIZATION OF RELATIVELY NEW BANK

Baltimore Heat Corporation Gets Excellent Heating Results in 9-Year-Old Bank Building

WEBSTER MODERATOR SYSTEM

Baltimore, Md.—That heating systems sometimes become obsolete before they become old was demonstrated in the five-story building which houses the Baltimore branch of the Federal Reserve Bank of Richmond.

When constructed in 1927, the Federal Reserve Bank building was modern in every detail. In 1936, only eight years later, the rapid developments in heating science led the Baltimore Heat Corporation, well-known firm of heating contractors, to install Webster Central Control as a necessary step in keeping the heating system up-to-date.

The building owners authorized the Baltimore Heat Corporation to carry out the Webster Heating Modernization Program.

With the Webster Moderator System, steam is delivered continuously to all radiators without excessive heating, thus correcting the distribution weakness of the old installation.

The need for a central heating control responsive to outdoor weather conditions has been met by an Outdoor Thermostat, which adjusts the steam supply automatically with every change in weather or wind direction. A manual Variator permits the operator to modify the effect of the thermostat.

"The Webster Moderator System has enabled us to maintain uniform, adequate temperatures throughout the building," says F. W. Wrightson, Assistant Cashier.

"There has been a noticeable improvement in the cleanliness of our building since the introduction of district steam service. This means better heating service."

Use of district steam for heating was authorized because of its economy and dependability in combination with the Webster Moderator System.

For further facts about comfort and economy in heating new buildings as well as in modernization of existing installations, address

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HIGHER HIGHWAYS FOR TOMORROW

(Concluded from page 90)

Johnson (assigned as chief pilot of XC-35) and a group of Air Corps technicians have spent well over 200 hours in the air with the ship, most of it at levels that will not support human life, and never once has the emergency supply of oxygen carried aboard been turned on. As a result of the success of the work, the late chief of the Air Corps stated that pressure-cabin operation has been shown to be entirely practicable and the construction of dependable and effective pressure-cabin machines to be definitely within the manufacturing capabilities of the present aircraft industries of the United States.

And so, when the committee that was to award the Collier Trophy "for the greatest achievement in aviation in America" for last year finished its deliberations, it is not surprising that the decision favored the Air Corps for its high-level work. What the Army has discovered with XC-35 will not only be of tremendous benefit to all service aviation in developing a more efficient national air defense but is already providing great impetus to the high-level, overweather commercial flying of tomorrow. At least two pressurized transport machines are under actual construction in this country: the four-engined Model 307 Boeing and the two-engined Model 20 by Curtiss-Wright. The new Douglas DC-4, now being test flown, is not arranged for cabin pressure at the moment, but the engineering work necessary for conversion is completed, and there is little doubt that future models of this machine will be cruising with passengers at 25,000 feet with the rest of them.

Air travelers of 1942, shuttling back and forth from Coast to Coast or across the Atlantic in 10 to 12 hours at levels high above the discomforts of local storms, may well look back and thank Major Greene and his flying machine for the work they did in 1937.

THE INSTITUTE GAZETTE

(Continued from page 85)

modern language instruction at the Institute. Thereby the Committee feels that it can better present the reasons behind specific recommendations. Decision as to the inclusion of a subject in any curriculum is naturally determined on the basis of certain principles. These are apt to be reasonably apparent in the case of scientific subjects related to the planned courses of technical instruction, but much more difficult to enunciate for those subjects which fall in the category of the humanities. The aim of the Institute is not merely to graduate skilled technicians. Rather, our ideal is to provide a source of educated men, thoroughly grounded in the technical aspects of an engineering or scientific profession, who shall also have some correlated knowledge of the general work and life of the world. Accordingly we have the humanities in our curriculum, with modern languages among them. The Committee has endeavored to find out what may reasonably be considered as funda- *(Continued on page 94)*

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The Institute publishes a variety of bulletins, as well as a catalogue of general information essential to the entering student. The Technology Review Bureau will be glad to send, gratis and post free upon request, one or more copies of any publication listed below, or to forward any special inquiry to the proper authority.

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2: For announcement of courses offered in Summer Session, ask for Bulletin 2.

3: For information on courses in Architecture, both Undergraduate and Graduate, ask for Bulletin 3.

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THE INSTITUTE GAZETTE

(Continued from page 92)

mental principles for the inclusion or exclusion of modern languages in our courses of study, for it is particularly important that these decisions should be determined by principles and not merely by tradition.

The inclusion of modern languages in college entrance requirements and the curricula of our colleges appears to have been too often determined from the conventional viewpoint. It is not the purpose of this report to discuss the problem of any institution other than our own. In the liberal arts colleges, decisions seem to have been influenced by the conventional attitude toward modern languages as a part of an education and also by the fact that a certain number of students wish to take such courses to prepare themselves for specialized work in teaching or research in the modern language field. The Institute fortunately is in a position to take a scientific and, if necessary, unconventional attitude on this matter.

This is a practical problem. The inclusion of a subject in the curriculum costs the Institute money for salaries, space, and equipment and costs the student valuable time which might be spent on something else. The two principles which we think should determine the inclusion or exclusion of modern languages in the curriculum of the Institute are as follows: (1) Is this subject a necessary or desirable tool for increased scientific accomplishment? (2) Is this subject a necessary or desirable part of the liberal education of our graduates?

With regard to the first principle, modern languages are of some importance in certain Courses as a tool for increased scientific accomplishment. Examples are the usefulness of French in reading the important architectural literature written in that language and, in the case of German, the ability to understand the scientific literature in such fields as physics and particularly chemistry. The technical literature in Spanish and Italian does not appear to be generally important enough to warrant emphasis. The modern language need of students of science and engineering is primarily one of technical vocabulary. They of course should have a knowledge of the simple structural characteristics of the language, such as can be gained from classroom instruction, but no vocabulary control adequate for the reading of scientific works can possibly be gained in any reasonable allotment of time in the curriculum. The individual student must take the building of a vocabulary as a personal problem and dig it out for himself in his own time.

The Committee believes therefore that French or German can be a valuable tool to students in certain courses; that preparatory school modern language instruction should have given a structural background, on the basis of which students who have studied the language should be able to dig out their scientific vocabularies by themselves; that where such preparatory school training is lacking, the Institute's courses for these students should be confined to this elementary structural requirement and definitely pointed to that end.

(Continued on page 96)

Should ENGINEERS

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THE INSTITUTE GAZETTE*(Continued from page 94)*

With regard to the second principle, previously stated, consideration of modern languages as a necessary or desirable part of the liberal education of our graduates brings out the following points: A foreign language may be useful as a means of communication in foreign travel or in personal relations with foreigners. It may be valuable to those who enter businesses which involve residence in a foreign country. Knowledge of another language can result in a general broadening of the mental horizon and a certain cultural satisfaction.

The Committee's comments on these points are as follows: (1) Relatively few find that modern languages as at present taught generally in this country are of much value as a means of communication with foreigners whether at home or abroad. (2) Relatively few enter businesses which involve residence abroad. We do not think that these two points are important to enough individuals to justify any general language requirement. (3) Modern languages effectively taught can serve as an extremely valuable broadening influence, but unless they are presented in such a manner as to arouse a definite interest, the Committee feels that much of the time spent on them is wasted.

From the foregoing reasoning, the Committee draws the following conclusions: (1) The aim of each modern language course given at the Institute should be clearly defined. (2) The ability to read foreign technical literature should be required in the Courses where those in charge ascribe importance to such ability. (3) The Institute should provide carefully planned elementary modern language instruction for students who are specializing in fields which require it and who have not had preparatory school elementary language training. Eventually it may be possible to eliminate such instruction by substituting corresponding entrance language requirements. (4) The responsibility for acquiring a technical reading vocabulary should be placed on the individual student and not on any Institute modern language instruction. (5) Knowledge of at least one modern language can be an important element in the liberal education of our graduates. For this reason the Institute should continue to provide broad modern language instruction for such students as elect to take it among their humanities. (6) Such language courses should be carefully planned to have intrinsic interest and not be allowed to disintegrate into the conventional, dull drudgery of grammar rules, oral translation of the foreign language, and written translation from English into the foreign language. (7) The basic emphasis of these courses should be on the language as a medium for the communication of ideas, and interest should be stimulated by such means as phonograph records, foreign films, and extracurricular conversation clubs. (8) The constant attempt of the Department should be to discover new ways of vitalizing modern language instruction, even at the expense of the conventional and traditional methods which have been used generally for so many years.

*(Continued on page 98)**Do you know that...*

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Technology Review for No. 10. In an article headed "Synthetic Atmospheres," states "Synthetic atmospheres may be the challenge of the earth's atmosphere. Perhaps, points out the paper the

is be Scientists?
Joseph Mayer
TECHNOLOGY REVIEW
ness have produced at least a few times as many great scientists in the last century as had Galileo. Yet how many great scientists had Europe produced before 1729? Hardly a single outstanding achievement in all history.

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by a quick movement from the target, you are better than a man with only one eye gets a sensation of depth, although he learns to determine depth and perspective.

anes for Gold Mine
By John J. Rowlands
cerpts from the Technology Review
The mountains of the great north of Australia are old-bearing River. This ant, for this stands in a or emmed in h
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A Billion Wild Horses
By STUART CHASE
from the Technology Review
Decoration by W. Stuart Chase: N

Man Slave to Machine
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nature. In steel mills that oc-
radiate heat more scorching
the hottest desert
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fog a

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WAVES TES
Dr Compton Discuss
Results in Tech Review
New Constant Max Growth, etc.

Do Airlines Offer T
the Merits and Demerits of the Services
er Five Years of Intensive Development
Daniel C. Sayre in Technology Review

Beauty versus Safety
By Dean A. Fales
Condensed from Technology
VIEW GAS LI
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M. I. T. Publication Tells
of Recent Discoveries
Ethiopian soldiers, because of the of rigid
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Science Lends a New Arm to Industry
Spectroscope Performs the Services of a Gene in Quick and
Exact Analysis of a Particular Product
R. Harrison in Technology Review
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TECH REVIEW DISCUSSES
IMPROVED AUTO SPRING
The Technology Review for May
says in its latest issue that great
experimental progress has been
made in the development of a new
type of automobile spring which
works something like a bellows.
According to the Review, the
device consists of two rubber
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By STUART CHASE
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THE INSTITUTE GAZETTE*(Continued from page 96)*

The Committee recognizes that reforms along this line will not be immediately possible of complete accomplishment but believes, however, that this is the direction in which we should move as an institution.

Dard Hunter Paper Museum

THOSE of us who have seen plans for further allocation of space in the Institute's new Rogers Building are much interested in a blueprint which bears a rectangular reservation marked "Paper Museum." The significance of that notation, first revealed in *Footnotes*, the bulletin of The Friends of the M.I.T. Library, lies in the news that the great collection of handmade papers gathered from all parts of the world by Dard Hunter, internationally recognized as the greatest living student of papermaking, is coming to the Institute. Furthermore, Mr. Hunter himself will shortly join the staff of Technology as curator of the Dard Hunter Paper Museum.

Descended from a family whose name has been associated with printing in Ohio for more than 120 years, the roots of Dard Hunter's lifelong interest in the history and traditions of papermaking may be traced from Ohio to Virginia, where the Hunters first printed in the New World, and thence to Scotland, the soil from which the family printing traditions sprang.

No one interested in the making of fine books can be unaware of the unique accomplishments of Dard Hunter. From his private press at The Mountain House, Chillicothe, Ohio, came what is, perhaps, the first book of which the same man was the author, illustrator, maker of the type and paper, as well as the printer. Dard Hunter's books are, by necessity, limited to small editions. In his eagerness to share with others what he has learned, his books are not only printed on the finest papers but several are richly interleaved with numerous specimens of rare and beautiful papers made by primitive methods in various parts of the Far East.

For nearly 40 years Dard Hunter has searched the remote places of the globe in his studies of primitive methods of making papers. He hunted in Mexico and the islands of the South Pacific Ocean for tools and specimens of the primitive paper mills and made an

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EDWIN C. SMITH '91, President

exhaustive study of papermaking in China, Korea, and Japan, where paper enters into almost every phase of life, from the most sacred religious rituals to the prosaic purposes of clothing and shelter. To those who may think the study of paper must be a dry and technical pursuit, we recommend Mr. Hunter's "Papermaking in Southern Siam," the chronicle of a journey to the primitive paper mill at remote Bangsom, operated by Tym and Piung Niltongkum and their two daughters. Here is the story of lovely Siamese papers made from the bark of the *khoi* tree, the preparation of black dye from the hulls of betel nuts, and the staining of the dull black temple papers on which Buddhist priests in canary-yellow robes write in yellow ink.

Dard Hunter is a native of Steubenville, Ohio, and was educated at Ohio State University, the Graphische Lehr und Versuchs-Anstalt and the Kunstgewerbe Schule in Vienna, and the Royal Technical College of London. In 1931 Lawrence College awarded him the honorary degree of doctor of literature. From 1903 until 1910 Mr. Hunter was art director of the Roycroft Shop at East Aurora, N. Y., home of the late Elbert Hubbard, where he designed more than 100 books. In 1919 he settled himself at The Mountain House and began there the production of handmade paper for his books, of which five of a total of nine were printed in type designed and hand-cast by the author. Last year, however, Mr. Hunter announced that he would discontinue the use of hand-cast type and that his books, "Papermaking in India," "The Story of Paper," and "Papermaking in Burma and Indo-China," now in preparation, would be printed in hand-set foundry type on paper appropriate for the subject.

We hope that the Dard Hunter Paper Museum at the Institute will include not only his books and his distinguished collection of papers and papermaking implements but the very paper-mill equipment with which he has proved himself a superlative craftsman, as well as a student whose research on the history of the universal and fundamental medium for the advancement of thought — paper — is a notable contribution to culture.

Our Lady Skipper

ALWAYS the unfulfilled desires of man respond to a fairy tale. Freely shaking off his familiar existence, he steps into a world where obstacles, although present — sometimes in extraordinary amount — are surmounted surely. Achieving something of this fairy-like release, Marion Rice Hart, '13, has written of an adventure which transcends the mere tale in being real.* Wearying of her colorful and comfortable establishment at Montfavet, France, she suddenly announced that she intended to buy a yacht. She "liked yachting and, when the boat was going . . . could tell the front from the back end."

Molly Hart's independence and unpredictableness and her delightful sense of humor carried her triumphantly through the ordeal of yacht shopping to the purchase of the auxiliary ketch *Vanora*. (Concluded on page 100)

* "Who Called That Lady a Skipper?" New York: Vanguard, 1938. 313 pages, \$2.75.

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THE INSTITUTE GAZETTE

(Concluded from page 99)

Training as a chemical engineer at M.I.T., research in the General Electric laboratories in Schenectady, work on a geological survey of the West Point sector, and four years of stone carving would not seem to be nautical preparation. But they developed adaptability and ingenuity in one who seems constantly surprised at her success in new fields.

Finding the repair price beyond her means, Mrs. Hart set to work on the 90-foot ketch herself, aided by a sculptor and his wife, a Greek girl "who had just finished giving a course of lectures on philosophy," and Rusty, a young cousin who "still had three weeks of his Easter holidays." This was in April, 1936. In August the trip began, from East Cowes for the Bay of Biscay, thence through the Mediterranean and the Red Sea, to Singapore, Bali, Komodo — to mention only a few of the ports of call.

Mrs. Hart has written this part of the book as a series of letters to her brother, who must himself be a sympathetic and pleasing person, as she writes with freedom and humor a lively account of difficulties and successes, giving a clear and entertaining picture of personalities and places. Discouraged by encounters with unfortunate skippers, Mrs. Hart practiced navigation through the Mediterranean and at Port Said took over herself.

After the first 24 hours she wondered how any sailors ever live to grow up, but at Port Sudan "we came in . . . in grand style and nobody nearly so surprised as I." By December 25, 1937, this lady skipper and her crew had arrived at Banda, British India, where they paused for a little mountaineering, and Mrs. Hart wrote Tom: "That is all for the present." We hope when she comes home through the Pacific, her facile pen will give us the rest of the story.

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POWDER COMPACTS

(Concluded from page 76)

This may be answered if we consider how dependent powder metallurgy is on the techniques of engineering and the pure sciences. For an educational institution to surround powder metallurgy with a halo in the form of a complete curriculum not only is unsound pedagogically but furthermore would be dangerous for both teacher and student. After all, we know that the best apprenticeship in engineering practice is still obtained in industry itself. To satisfy the needs of some students in metallurgy, chemical engineering, and physics, as well as graduate engineers in the local industries, the Institute's Department of Metallurgy has established a short elective seminar course in powder metallurgy. This is to be followed by laboratory research during the second term. With the coöperation of research workers and engineers, half the time of the seminar course is devoted to listening to reports of problems encountered in practice. The remainder is given to a discussion of original papers from scientific or engineering periodicals which bear on the subject. Fortunately such papers have a definite relationship to the student's courses in other fields and thus help to widen his horizon without dulling the sharpness of his endeavors. With a research laboratory in powder metallurgy planned for next term, we hope it will be possible to contribute to an understanding of some of the knotty problems which occur in the subject. Since the basic aspects of such problems in a pure sense are also the problems of other research workers in the Institute regardless of department, we feel that our program is most promising.

EDITOR'S NOTE. *The Review, with the help of Dr. Wulff, will be glad to supply Review readers with a reference list of the few articles that have been published on powder metallurgy. Please address requests for this bibliography to The Technology Review.*

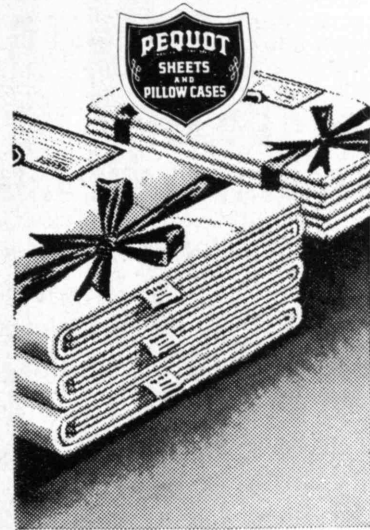
THE TREND OF AFFAIRS

(Continued from page 69)

of a degree of 459.69 below zero F., the point at which scientists believe heat ceases to exist in matter and where molecular motion almost stops.

Internal Friction in Metals

THE effect of general strains and of internal structural changes on metals, difficult of detection by most means, appears to be clearly indicated by that mysterious property of metals known as internal friction — a property which causes less energy to be released by the metal than is put into it or, in other words, enables a metal to absorb a portion of that energy. In such processes as the age-hardening of alloys, for example, odd and provocative changes in internal friction occur, among which there appears to be some relationship, though that itself seems often contradictory. Thus, with a certain copper alloy, the amount of internal friction in the metal as quenched goes (Concluded on page 102)



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Thomas H. Boyd, '23
Wildor E. Perkins, '25
Charles P. McHugh, '26
Daniel J. Hanlon, '37

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THE TREND OF AFFAIRS

(Concluded from page 101)

through a marked series of changes during an aging period of two hours at 500 degrees C. If then the metal is quenched and cold-worked slightly, its damping capacity jumps back to beyond what it was in the first place.

That this property may have distinct industrial and engineering advantages seems likely. But in the judgment of Professor John T. Norton, '18, of the Institute's Department of Metallurgy, who has been studying the problem for some time, the abstract, or research, aspects of damping must be thoroughly investigated first. The great question in this work is that of establishing a method of accurately measuring internal friction. A reliable method being set up, the position of damping as an indicator of other qualities of the metal can then be studied. Not the amount of damping but damping as a symptom is the center of interest. Its importance rests in the fact that the investigator cannot shrink himself like Alice in Wonderland and thus get inside the metal to see what is going on; a dependable symptomatic diagnosis is therefore of much potential value.

To get at this tool value of damping, Professor Norton has been investigating methods of measurement, synthesizing existing instruments and improving upon them to produce a sensitive, automatically recording torsion pendulum. In this device, the specimen to be tested is used as the elastic suspension of the inertia bar, and the record is taken off by means of a beam of light making a track on photographic paper mounted on a moving drum. The test specimen is locked in place in vertical position between the uprights of the machine, its lower end being held rigidly in the heavy lower portion of the frame. Its upper end is held in the delicately pivoted inertia bar. This bar is drawn out of the plane of the uprights by two magnets and is then released, oscillating as an inverted torsion pendulum with the specimen as the elastic element. Ideally, in the absence of any damping, it would keep on oscillating; actually, of course, the range of oscillation diminishes. The decrement of the oscillation is a measure of the damping capacity of the specimen.

The new machine is an advance in the delicacy of the pivot system holding the inertia bar and differs from earlier instruments of the kind in that, instead of being suspended by a wire in order to prevent transmission of energy to its surroundings, it is mounted on a massive concrete base. Use of the light beam as a means of recording the results eliminates the frictional losses that might be set up by a pencil or stylus attached to the inertia bar and tracing the record directly on paper.





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CHECK LIST OF THE ACTIVITIES AND ACHIEVEMENTS OF M.I.T. ALUMNI, OFFICERS, AND STUDENTS

Our Felicitations

☐ To LOUIS S. CATES '02, on winning the William Lawrence Saunders Gold Medal from the American Institute of Mining and Metallurgical Engineers.
☐ To FRANK B. JEWETT '03, on winning the 1939 John Fritz Gold Medal for "vision and leadership in science, and for notable achievement in the furtherance of industrial research and development in communication."

Welding Ideas

☐ To encourage and stimulate scientific study, research, and education in the development of the arc-welding process, the James F. Lincoln Arc Welding Foundation of Cleveland, Ohio, sponsored a contest during the spring, results of which were published in the fall and showed a gratifying number of prizes to have been won by Technology men. In order of seniority at the Institute: VICTOR WINDETT '89, "Arc-Welded Processing Machinery and Plant for Steam-Boiler Fuel Gas"; CHARLES H. HUGHES '00, "Commercial Welder"; ABBOTT ALLEN '10, "Allen Rotary Heat Exchanger"; ROBERT C. DOREMUS '14, "Modernizing Michigan's Largest Brewery with Arc-Welded Piping"; THOMAS E. RAYMOND '16, "Arc Welding in the Economical Manufacture of Hydraulic Closer"; NELSON M. FULLER '23, "Precision Methods in Arc-Welding Milk Pasteurizers"; LEONARD L. F. REMINGTON '26, "Arc-Welded Design of Platen Die-Cutting Presses"; JAMES M. WHITE '28, "Hot Blast Tube for Down-Draft Oil-Burning Parlor Heaters"; ANANT H. PANDYA '31 (collaborating with R. J. Fowler), "The All-Welded Grid Applied to Plane and Spatial Structures"; MAURICE L. SELLERS '31, "Design and Construction of an Arc-Welded Cargo Ship"; ROBERT H. MACY '33, "Savings of Cost and Weight by Welded Construction of a Railroad Car Float"; RAYMOND P. HOLLAND, JR., '34, "Arc Welding in Airplane Design."

Written

☐ By CARLETON ELLIS '00, coauthor with Miller W. Swaney, "Soilless Growth of Plants," Reinhold, New York City.

☐ By ALLEN B. McDANIEL '01, an article, "Revamped Plant Gets Added Kw. at \$90," *Electrical World*, July 16.

☐ By ARAM TOROSSIAN '08, "Guide to Aesthetics," Stanford University Press.

☐ By LLOYD C. COOLEY '11, an article, "Distillery By-Products," *Industrial and Engineering Chemistry*, June.

☐ By WYLIE J. DANIELS '13, "The Village at the End of the Road; A Chapter in Early Indiana Railroad History," Bobbs-Merrill, Indianapolis, Ind.

☐ By J. WARREN HORTON '14, an article, "An Electrical Cardiographometer," *Electronics*, August.

☐ By J. SPOTTS McDOWELL '16, two articles: coauthor with W. F. Rochow, "Choosing Refractories for the Super-Structure and Regenerators of Modern Glass Tanks," *American Glass Review*, Volume 57, Numbers 38, 39, and 40; coauthor with L. L. Gill, "Refractory Arches," *Steel*, April 25 and May 16.

☐ By BRIAN C. CURTIS '17, "Life Story of the Fish," Appleton-Century, New York City.

☐ By WINFIELD I. McNEILL '17, an article, "Organization and Control," *Chemical and Metallurgical Engineering*, June.

☐ By ROBERT R. LITEHISER '19, coauthor with K. B. Woods, "Soil Mechanics Applied to Highway Engineering in Ohio," Engineering Experiment Station Bulletin Number 99, Ohio State University.

☐ By PERCY BUGBEE '20, an article, "Progress in Fire Control," *The American City*, July.

☐ By LEWIS P. TABOR '22, an article on the use of filters in photography, written for Carl Zeiss, Inc., New York City.

☐ By EDMUND T. ALLEN '23, with C. B. Allen, an article, "Tons Aloft," *The Saturday Evening Post*, September 17.

☐ By EDWARD S. SHEIRY '24, "Elements of Structural Engineering," International Textbook, Scranton, Pa.

☐ By ROBERT S. HARRIS '28, an article, "Medical Application of Radiant Energy," *Medical Record*, April 20. Collaborating with JOHN W. M. BUNKER, Staff, Dr. Harris has written also, "A Reappraisal of Vitamin D Milks," *New England Journal of Medicine*, July 7.

☐ By PARKER MORELL '28, an article, "Name Your Game," *The Saturday Evening Post*, October 29.

☐ By HUNTER ROUSE '29, "Fluid Mechanics for Hydraulic Engineers," an Engineering Societies Monograph, McGraw-Hill, New York City.

☐ By MORRIS COHEN '33, Technical Publication Number 978, American Institute of Mining and Metallurgical Engineers, "Age-Hardening of Duralumin," *Metals Technology*, October.

☐ By DUGALD C. JACKSON, Professor Emeritus, the foreword to a brochure, "The Consulting Engineer," published by the American Institute of Consulting Engineers. Parts of this brochure were contributed by GEORGE A. ORROK '89, MAURICE R. SCHARFF '09, and KARL T. COMPTON, President. Dr. Jackson wrote also this summer, "Guglielmo Marconi," *The Scientific Monthly*, August.

☐ By the M.I.T. LIBRARY, "A Technology Bookshelf," being a record of books published by Alumni during the academic year, 1937-1938. Copies of this list may be had upon application to the Library.

DEATHS

* Mentioned in class notes.

☐ EDWARD H. FOOTE '71, October 1.

☐ JOHN H. AVERY '77, April 8.

☐ WILLIAM D. SOHIER '78, October 15.*

☐ C. GRANT LA FARGE '83, October 11.

☐ GEORGE O. DRAPER '87, October 21.

☐ WALTER S. MOODY '87, November 7.

☐ HENRY P. SPAULDING '90, October 16.*

☐ CHARLES F. HOPEWELL '93, October 17.

☐ WILLIAM H. WHITTEN '96, October 5.*

☐ FRED C. BOARDMAN '98, date not known.

☐ ALICE E. DACY '02, July 24.

☐ CHARLES A. SMITH '02, August 6.*

☐ ERNEST C. LEVY '04, September 29.*

☐ RALPH L. SEGAR '05, August 16.*

☐ HERBERT M. WILCOX '05, July 28.*

☐ ALDEN H. TRULL '08, October 18.

☐ CHARLES H. HARRINGTON '11, October 9.*

☐ FRANCISCO P. LASERNA '33, July 27.

NEWS FROM THE CLUBS AND CLASSES

CLUB NOTES

Montana Society of the M.I.T.

After holding the office of secretary-treasurer of the Society for 17 years, Carl J. Trauerman '07 has resigned, as he was of the opinion that the position should be held by a younger man. Edward R. Clark, Jr., who was graduated with the Class of 1935 and received his master's degree in 1936, was elected to the office. He is in the mining engineering department of the Anaconda Copper Mining Company.

We were very much pleased to have with us, on October 6 and 7, B. Alden Thresher '20, Director of Admissions at M.I.T. He arrived at noon on the sixth and was taken down the Belmont copper mine of the Anaconda Copper Mining Company by the foreman of that mine, Walter R. C. Russert '18. After his visit underground Frederick C. Jaccard '07, mechanical superintendent of the company, showed Professor Thresher the surface plants and equipment on the Butte Hill. After Professor Thresher had finished his inspections, a few of us gathered for a beefsteak dinner at the New Finlen Hotel, where our guest gave us all the late information about M.I.T. His talk was a very interesting one and received quite a bit of publicity in the Butte papers the next day. Attending the dinner to honor our guest were Russert, Jaccard, Clark, Trauerman, and William A. Kemper '04, who is president of the Butte Land and Investment Company and director of the Miners National Bank.

On the morning of the seventh, Kemper, who is Honorary Secretary for M.I.T. in this vicinity, took Professor Thresher to the Butte High School and the Montana School of Mines, after which our visitor departed for Spokane and other points in the Northwest. — EDWARD R. CLARK, JR., '35, *Secretary*, 601 West Quartz Street, Butte, Mont.

National Metal Congress, Detroit

The Technology luncheon in connection with the programs of the National Metal Congress and Exposition, October 17 to 21, drew a goodly group. Those who attended were practically all out-of-town people who had come to Detroit for the convention, but John E. Longyear '26, Secretary of the Detroit Club, was able to drop in to this luncheon for a few minutes. Others attending were Victor O. Homerberg '21, Associate Professor of Physical Metallurgy at the Institute; Augustus B. Kinzel '21, Union Carbide and Carbon Research Laboratories; Edwin D. Martin '22, Inland Steel Company; George B. Waterhouse, Professor of Metallurgical

Production, M.I.T. (President of the American Society for Metals); Robert B. Sosman '04, research laboratories of United States Steel Corporation (delivered a series of three evening lectures on "Pyrometry of Solids and Surfaces"); William Shockley '36, Bell Telephone Laboratories; Walter Crafts '26, Union Carbide and Carbon Research Laboratories (collaborated with J. L. Lamont of the same laboratories in preparing two papers presented at the conference: "Some Effects of Deoxidizers in Low Carbon, 15 per cent Chromium Steel" and "Hardenability of Low Chromium Steels"); Robert K. Wells '24, United States Navy; Chauncey A. Crawford '13, International Nickel Company; Clayton D. Grover '22, Whitehead Metal Products Company of New York, Inc.; Francis G. Jenkins '34, Eastman Kodak Company; Harry B. Pulsifer '03, American Steel and Wire Company; and Leonard C. Peskin '29, American Steel and Wire Company.

Just to pause for breath and not because there is any distinction between the group above and the group to come, we start a new paragraph: Igor N. Zavarine '20, Assistant Professor of Physical Metallurgy at M.I.T.; Lloyd E. Raymond '22, Singer Manufacturing Company; Walter G. Bain, Jr., '36, Allis-Chalmers Manufacturing Company; Irving H. Cowdrey '05, Associate Professor of Testing Materials, M.I.T.; Alexander A. Rostarchuk '34, Amtorg Trading Company; Vincent E. Lysaght '24, Wilson Mechanical Instrument Company; George A. Chutter '21, Hevi Duty Electric Company; Frances H. Clark '22, Western Union Telegraph Company; Harold McCrensky, M.I.T.; James B. Hess '38, J. H. Williams and Company; John N. Pappas '36, Titanium Alloy Company; Felix S. Klock '36, Hamilton Propeller Company; Alfred Ziegler '31, Wickwire Spencer Steel Company; Arnold E. Keskulla '32, Aluminum Company of America; Allan L. Tarr '28, Cooper Union; Ernest R. Carr, Jr., '34, Oliver Iron and Steel Corporation; Morris Cohen '33, Assistant Professor of Physical Metallurgy, M.I.T. (read paper on "The Age Hardening of Duralumin"); Robert D. Williams '37, University of Illinois; Carl F. Floe '35, University of Notre Dame; George N. Wedlake '28, Cockshutt Plow Company, Ltd.; David L. Edlund '28, Vanadium Corporation; Harold L. Geiger '28, International Nickel Company; D. E. Ackerman, M.I.T.

There were some Technology men who presented papers at the meetings but who apparently did not attend the luncheon: Marcus A. Grossmann '11, Carnegie-Illinois Steel Corporation (collaborating with S. F. Urban and M. Asimow), "Hardenability, Its Relation to Quenching and Some Quantitative Data"; Lester Tarnopol '34, University of Kentucky (collaborating with Ralph Hult-

gren), "Superlattices: The Effect of Silver on the Gold-Copper Superlattice, Au Cu"; Charles W. MacGregor, Associate Professor of Applied Mechanics, M.I.T., "The Plastic Flow of Metals"; John Chipman, Professor of Process Metallurgy, M.I.T. (collaborating with Anson Hayes), "The Mechanism of Solidification and Segregation in a Low Carbon Rimming Steel Ingot"; Robert W. Linsay '35 and John T. Norton, Associate Professor of the Physics of Metals, M.I.T., "The Effect of Plastic Deformation on the Age Hardening of Duralumin"; and Lincoln B. Barker '21, General Electric Company, "Notes on the Annealing of Copper Wire."

Technology Club of South Florida

October 10 was the occasion for another meeting of the members and their guests at the University Club in Miami. At the conclusion of an excellent dinner and after the transaction of the Club's business under the able direction of B. Howard Brown '30, President, G. Murlin Drury '35, chairman of the program committee, introduced James J. Marshall, a prominent Miami attorney. Mr. Marshall presented the gathering with a most interesting and thoroughly enjoyable lecture on "Celestial Engineering" (astronomy).

We sincerely hope that any M.I.T. member who has the occasion to visit Miami this winter will make himself known by phoning the Secretary at 2-2723. We offer informality, simplicity, and brevity at our club meetings, as well as an outstanding guest or guests of honor. — CLARENCE P. THAYER '23, *Secretary*, 1760 Northwest 41st Street, Miami, Fla.

M.I.T. Club of Western Pennsylvania

The first meeting of the Club was held on Thursday, September 29, with B. K. Shaner, the chief accountant of the Koppers Company, as the speaker of the evening. As Mr. Shaner is essentially an engineer, he gave us the story of the structure and operation of the Koppers Company not as an accountant but with an engineering point of view. His many charts and illustrations made his excellent talk the more interesting.

President Compton had luncheon with a group of Pittsburgh Alumni when he was here on November 10. We are fortunate in having Horace Ford as our chief speaker at our next meeting on December 6. He will give us the latest financial story concerning M.I.T., as well as some of the recent high lights of Institute life. All of which, it has been promised, will be supplemented with slides. — ROBERT A. OLSEN '35, *Secretary*, 5655 Elgin Avenue, Pittsburgh, Pa. STANLEY T. JOHNSON '36, *Assistant Secretary*, Schenley Arms Apartments, Bigelow Boulevard, Pittsburgh, Pa.

Tech Club of the University of Illinois

Because we have had no word from this Club for some time, The Review Editors are adapting to this purpose the following report made to the Alumni Secretary: On April 10 a dinner meeting was held at the home of the Secretary at which Whitney C. Huntington '23, professor of civil engineering at the University of Illinois, was the speaker. — The Urbana Club was awarded a stein in the Alumni Fund Drive last spring, and another source of pride among its members is the fact that Arthur Cutts Willard '04 is president of the University of Illinois. Other members in addition to the two just mentioned and the Secretary, whose name appears below, are Harold E. Babbitt '11, Horace J. Macintire '05, Wilbur J. Woodruff '22, Clifford P. Kittredge '29, Isabel Bevier '98, Edward W. Comings '34, Paul W. Daley '35, William S. Emerson '37, Frank C. Howard '17, Charles A. Keener '20, Joseph K. Roberts '28, Benjamin F. Vandervoort '27, Robert D. Williams '37, and Lester A. Brooks '35. — JAMES GROTE VANDERPOOL '27, *Secretary*, University of Illinois, Urbana, Ill.

Washington Society of the M.I.T.

The October meeting of the Society was held in a new location — the Mirror Room of the Lafayette Hotel, 16th and Eye Streets, Northwest — on Friday, October 21, at 5:00 P.M., with Edwin W. James '07 presiding. In the absence of our Honorary Secretary, Proctor L. Dougherty '97, who was out of town on business, Amasa M. Holcombe '04 was called upon to introduce a number of newcomers. In addition, he announced the splendid performance of the men whom the Society had sent to Technology, including Albert H. Bowker '41, who led his Class in scholarship for the past year.

Following the preliminaries, Mr. James introduced George A. Finch, Assistant Secretary of the Carnegie Endowment for International Peace and Secretary of the American Society of International Law, who spoke on "The United States and Europe in the Future." As would be expected, Mr. Finch's talk dealt much with the past, as history is the best indicator of what we may expect in the future; and his talk dwelt considerably on the elements of justification for Hitler's recent actions. He outlined the many respects in which the Allied Powers had failed to live up to their engagements at Versailles and pointed to these as the cause for the rearming of Germany. He also stated that at no time had Hitler promised to respect the eastern boundaries. The talk provoked a lot of comment from the membership, and Mr. Finch was called upon to answer a lot of questions.

Following the talk, the Society enjoyed an excellent dinner served by the Lafayette Hotel, and the meeting adjourned about 7:30 P.M. In the course of the evening an endorsement was circulated among those attending, asking for their signatures of approval to the nomi-

nation of Allen B. McDaniel '01 as a candidate for the National Nominating Committee for District 6, comprising Pennsylvania, Delaware, Maryland, Virginia, West Virginia, and the District of Columbia. McDaniel had already been endorsed by the executive committee of the Society. — HENRY D. RANDALL, JR., '31, *Secretary*, 119 South Chelsea Lane, Bethesda, Md. WILLIAM K. MACMAHON '22, *Review Secretary*, 818 25th Street, South, Arlington, Va.

CLASS NOTES

1878

From the *Harvard Alumni Bulletin*: "William Davies Sohier. Died at Boston, Mass., October 15, 1938. He was ill for a short time only. He had practised law in Boston, but retired about fifteen years ago. In early life he took an active part in politics and other public affairs. From 1888 to 1891 he served in the Massachusetts Legislature as a Representative from Beverly. He was afterwards on the staff of Roger Wolcott . . . , Governor of Massachusetts, and subsequently for a long time Sohier was president of the Republican Club of Massachusetts. For many years he was chairman of the Massachusetts Highway Commission. At one time he was president of the Boston *Journal*, a daily newspaper which suspended publication long ago. He was a trustee of the Massachusetts Eye and Ear Infirmary, and held other important posts. He was born in Boston, October 22, 1858, and attended the Massachusetts Institute of Technology before he entered the Harvard Law School. In 1880 he married Edith F. Alden. Mrs. Sohier died in 1919. Two daughters and a son, W. Davies Sohier, Jr. . . , survive." — ALFRED S. HIGGINS, *Secretary*, 248 Northern Avenue, Boston, Mass.

1886

Fred E. Foss, head of the department of civil engineering at Cooper Union for the past 29 years, was retired at his own request at the end of the last academic year. Following his graduation, Foss spent five years on railroad construction in the Middle West. In 1891 he was called to M.I.T. to develop a course of instruction in highway engineering. In 1893 he resigned from the Institute to take charge of the department of civil engineering in Pennsylvania State College, where he remained for 14 years. He resigned from Penn State to take a similar position with the Carnegie Institute of Technology at Pittsburgh, Pa. Coincident with his teaching work he served as civil engineering examiner for the municipal civil service commission of the city of New York and also as a director of the Railroad Federal Savings and Loan Association.

During the past season death has overtaken two members of the Class: George P. Aborn and Edwin P. Taylor. Aborn passed away at his home in Newton, Mass., on July 7. The greater part of his life was spent in the improvement, in-

vention, and manufacture of various types of pumping machinery. Starting in 1886 as draftsman in the Knowles Pump Works at Warren, Mass., his rise was rapid, and in 1905 he was made the works manager of the East Cambridge plant of the combined organizations of the Blake and Knowles Steam Pump Works and the Worthington Pump and Machinery Corporation. In 1928, at the age of 65, he retired from what had been his lifework; he continued, however, to find employment for his business and executive knowledge in the industrial department of the Harvard Trust Company and also in the activities of the Cambridge Industrial Association, which he served at different times as treasurer and as president.

Edwin P. Taylor died at his home in Waverley, Mass., on September 20. Soon after leaving the Institute, Taylor entered the employ of the Boston Light Company, now the Boston Edison Company. Since 1900 he had been manager of the Belmont Municipal Electric Light Department in Belmont, Mass. — ARTHUR G. ROBBINS, *Secretary*, 12 Grove Street, Winchester, Mass.

1888

When ordering an enlargement of the very fine group photograph made by Ned Webster just after the clambake at our 50th, Charlie Stone says: "Hope you have had a nice summer in spite of Europe and Hitler. Am feeling finely now after a vacation of nearly six months." We are all glad to hear this good news.

On August 3, Ben Buttolph completed 50 years with the Associated Factory Mutual Fire Insurance Companies and it was also his birthday; so Hovey T. Freeman '16, President, did the proper thing and tendered a party for Ben at his home at Poppasquash Point, Bristol, R.I., at which all the officers and staff of the Manufacturers group were present. Ben was presented with a Gorham sterling plate, duly engraved with a full statement of the donors and the occasion. Ben is to be congratulated, for very few of us started in business in August, 1888, two months after graduation, and have remained with the same company through half a century.

Henry Bates has sent us a fine photograph of a train of four two-ton loads of hay being drawn by a big tractor to the barn at Bates Farm, Carlisle, Mass., owned and operated by himself and son. This is one of many such trains harvested this summer.

Your Secretary visited his birthplace, York Village, Maine, in August at the time of the 300th anniversary celebration of the First Parish Church of York and listened to a sermon on "The Doleful State of the Damned, Especially Such As Go to Hell from under the Gospel," preached by the Reverend Samuel Moody in 1710. The ushers carried guns six feet long for use in case of an attack by the Indians.

The photograph taken by Ned Webster at our golden anniversary celebration in June at Marblehead was so fine that quite

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a number desired enlargements after seeing the original print which Ned sent to all 41 who attended the largest and most successful reunion ever held by the Class. The Secretary received quite a number of letters from classmates in appreciation of this generous act of our President.

Charlie Faunce, "boss of the clam-bake," sent your Secretary a copy of the "Hurricane Souvenir" of the *Standard-Times* of New Bedford, Mass., dated October 1, showing 16 pages of wrecked buildings and boats around New Bedford caused by the big storm. We hope none belonged to him and that he will have a chance to replace some of them.

Sanford Thompson was the only one who accepted the Secretary's invitation to play golf with him at Chebeague Island this summer. Thompson and his family passed a few weeks at Moody Beach, near Ogunquit, Maine, and he arrived at the island just before noon one day in time for nine holes before luncheon. After that we played 18 holes more followed by a light supper, principally peach shortcake, before Thompson took the 4:15 for Portland and home. The best thing about our game was that we came out all even at the end of the 27 holes with the handicap "designed" by the Secretary. Sanford's best 18 holes was 92 and his opponent's 88. Sanford says that he had a good time, and we hope more '88 men will try the experiment next summer.—BERTRAND R. T. COLLINS, *Secretary*, 16 Chauncy Street, Cambridge, Mass.

1890

Franklin Knight has now retired to Great Barrington, Mass. — Bertram Lenfest is traveling in England, meeting other descendants of his ancestors, whom he says he has now traced back to about 1475. — The Boston *Evening Transcript* reports that Poland has been selected as advisor to the Rutland Railroad. — The address of Edward B. Stearns has been changed from 84 Hawthorne Place, Montclair, to Rensselaer Road, Essex Fells, N.J. — The New York *World-Telegram* recently had an article on "The Future is Electric. Laboratory Research Produces Seeming Magic," in which the development of the General Electric Research Laboratory, which was organized by Whitney, is discussed. Whitney received the Marcellus Hartley Public Welfare Medal of the National Academy of Sciences in the spring.

We regret to announce the death at the Faulkner Hospital, Jamaica Plain, Mass., on October 16 of our classmate, Henry Plympton Spaulding, in his 71st year. His health had been failing for some time, and it was a very great disappointment to him that he was unable to be with the Class at the last reunion held at Swampscott. About a month ago at his home in Brookline he suffered a fall from which he was unable to recover. Although Spaulding was graduated as an electrical engineer, his interests were primarily in art rather than engineering. He was not only a good musician but also an artist and for many years he had a studio and with much success devoted himself to

painting. He is survived by his wife and a daughter, Mrs. Rudolf Berle of Scarsdale, N.Y. — GEORGE A. PACKARD, *Secretary*, 50 Congress Street, Boston, Mass. HARRY M. GOODWIN, *Assistant Secretary*, Room 4-136, M.I.T., Cambridge, Mass.

1892

The President of the Class, William R. Kales of Detroit, spent the summer at his home in Hyannisport, Mass., as usual, while Scott Parrish, Harry Carlson, and Spencer Hutchinson each spent part of the summer at Duxbury, Mass. Carlson was busy all summer with his duties as supervising architect during the construction of the Institute's new William Barton Rogers Building facing on Massachusetts Avenue and now forming an impressive part of the central educational unit in Cambridge.

The members of the Class will be shocked to learn of the death of Albert S. Heywood, who passed away at his home in Worcester, Mass., on May 31. He was for many years a consistent attendant at class meetings and alumni affairs, always taking a vital interest. At the time of his death he was president of the Heywood Boot and Shoe Company, a post which he had held for 25 years; also a trustee and vice-president of the People's Savings Bank, and an official of several other banking organizations. He leaves two daughters. — JOHN W. HALL, *Secretary*, 8 Hillside Street, Roxbury, Mass. W. SPENCER HUTCHINSON, *Assistant Secretary*, Room 8-219, M.I.T., Cambridge, Mass.

1894

Since the last batch of notes, a vacation period has intervened during which the Secretary made a brief trip to England to attend committee meetings of the International Institute of Refrigeration. He spent the last three days of his European visit in France, partly for the continuation of committee meetings and partly as the guest of our classmate Price in his delightful apartment overlooking the Seine. After visiting nearly all portions of the globe by airplane, Price has spent the recent months in Paris, where he has long made his permanent home, although he continues to have interests in southern California where he owns a large ranch. A visit with Price is a continuous joy: He is so thoroughly conversant with world affairs, particularly with affairs in Europe, that it is like a personally conducted university course in modern history. In addition to that, Price and his charming wife are such delightful hosts that anyone who is fortunate enough to sojourn with them for a few days is certain to come away with the feeling that he has been royally entertained.

It happened that the three days I spent with Price came just at the time of the visit of the King and Queen of England to Paris. The city was therefore *en fête* and was a hive of activity, gaily decorated for the occasion. Undoubtedly keeping in mind the happenings at Marseilles on an earlier occasion, the military and the police were in evidence everywhere, and permits were required for one to go and

come even to the apartment or hotel where one was living. As Price's apartment overlooked that part of the Seine where the royal vedette was to make its trip to the Hotel de Ville for special ceremonies, an unusual opportunity was given to his guests to witness the royal procession on the river. Price kindly extended his hospitality to several of my friends. Similarly, on the day of the arrival of the King and Queen, it was possible from his balconies to get a splendid view of the procession as it came through the Place de la Concorde and across the Concorde Bridge and in the evening from the roof to see the illuminations along the river and on the Eiffel Tower. The greatest pleasure, however, came from the three days of association with Price himself: We discussed many events which have transpired since the day in 1890 when we found ourselves working at adjacent desks in the freshman laboratories, and we spoke much of the '94 men and their doings.

During the Secretary's stay in London another event of great interest occurred. We all remember Anthony Maurice Robeson, who left at the end of the third year to return to South Africa where he had been employed before attending Technology and who since leaving the Institute has had a brilliant career as an engineer — not only in South Africa but in Alaska and South America as well. The Secretary had written to Robeson, expressing the hope that a meeting might be arranged, and on arriving in London was delighted to find a letter stating that Robeson and his wife were to come to England for a few weeks and were arriving on the day preceding my departure for Paris. We lunched together on the last day of my stay in England, and for about three hours we discussed the happenings to ourselves and other members of the Class which had taken place since the time, 45 years ago, when we had last met. It was interesting that when we met in the crowded hotel lobby at the appointed time, I instantly recognized Robeson. Forty-five years have rested lightly on him, but in look and manner he was unmistakable. He was not quite so quick in recognizing me, as he remembered a thin, pale youth who daily trudged across Harvard Bridge with him, and was not looking for a white-haired, ruddy, and rather broad-shouldered man. Anyway, it did not take long to establish our mutual relations, and it was a wonderful '94 reunion-luncheon we had together. Robeson sent, through the Secretary, his cordial greetings to the Class. Another fact of interest which came out is that Robeson and Price now occupy apartments on opposite sides of the Seine but almost within a rifle shot of each other. After years of separation in various parts of the world, their first meeting took place in Paris soon after Robeson had taken up residence there and was entirely a chance meeting, as Price recognized Robeson at the wheel of his parked car.

It is an unhappy duty to be obliged to record the deaths of several of our classmates: John C. Stevens, our Class Presi-

1894 Continued

dent in the freshman year and for many years connected with the banking business in Philadelphia, died on July 10; Nathan Cheney, who was with Stone and Webster for many years after leaving Tech and who has served the Class so efficiently on committees at the time of our five-year reunions, died on August 5 at his home in Belmont, after a long illness; Charles F. Hopewell, who entered with '93 but was with our Class during its latter years and was graduated in 1894, died suddenly at Wolfeboro, N.H., on October 12. All these men will be remembered most pleasantly by the Class, and their passing will be a source of great sorrow and regret. We must record also, although belatedly, the death of Frank L. Smith, who was with the Class in its freshman year and died on July 11, 1931.

While waiting in the parlor at the Copley Plaza before taking places at the head table for the dinner of the Associated Industries of Massachusetts, the Secretary encountered William L. Burrows, who incidentally mentioned that he had spent a year at Technology. Inquiry elicited that he had entered in 1890. We at once thus had a bond of common interest. At the end of his freshman year, Burrows got a job as draftsman with the General Electric Company at its works at Lynn, which was his home town. From this first association with that company he has gone forward in its employ and for some years has been vice-president in charge of manufacturing in all the General Electric plants. It was a great pleasure to meet Burrows, and it is a great pleasure to record here his splendid success. While he has never attended a class reunion, I hope that through our chance meeting pressure may be brought to bear on him so that when our five-year reunion comes in 1939, he may be induced to be present.

A letter from Doc Sayward informs me that he has changed his address from Slatersville, R.I., back to Griswoldville, Mass., where he formerly lived, as now, with one of his sons. Sayward has kept up his interest in the youth hostels in New England and during the past few months has made two radio broadcasts regarding them over WCOP — one on the "Salt Water Chain of American Youth Hostels in New England" and another on "A Group Around the Loop," which I imagine deals with those in the interior, especially in the hills of Vermont and New Hampshire.

The Secretary was extremely sorry to miss a visit from Henry Swanton in the latter part of June. Swanton came down from his Maine home, visited Tech, and was shown the new building then in process of construction. He fortunately was able to make contact with George Taylor and George Owen who had been associated with him in the senior year in marine engineering and with whom he has maintained a continuous friendship and occasional correspondence. It is unfortunate that Swanton is so handicapped by his lameness that he is not able to make more frequent visits to the Institute, but his is a rare spirit.

The following addresses of '94 men who have not been very active in their correspondence with the Secretary have been received: V. A. Mayer is now located at Russell Point, Ohio; Rev. Francis M. Adams, Sabattus, Maine; Frank Drake, who as a mining engineer has circulated pretty much all over the globe, now has an office at 123 Locust Street, San Francisco, Calif.; Theodore Horton, for many years an engineer in the state department of health and later in the division concerned with locks, canals, piers, and similar structures in the state of New York, sends Cotuit on Cape Cod as his present address. If Teddy is this near to Tech, he certainly ought to find opportunity to renew his acquaintance with the Institute. We shall expect him in 1939 at our reunion.

Harold Chase and Alan Clafin spent a portion of the summer on a wonderful vacation in the Canadian wilds, going down one of the rivers to Hudson Bay. No details have been submitted by either of them, the above information coming to the Secretary by way of friend Andy Fisher '05.

Mrs. de Lancey spent several weeks during the summer hunting ancient churches in France, especially those showing transition from Romanesque to Gothic. An attractive card from her, dated September 3, reports that she had discovered two which interested her greatly. Possibly this indefatigable researcher has made other discoveries ere now. — SAMUEL C. PRESCOTT, Secretary, Room 10-405, M.I.T., Cambridge, Mass.

1895

Harold Norwood Rust, VI, who was born on August 4, 1873, and died on July 29, was a native of Wilkes-Barre, Pa. Following his graduation he became interested in various business and banking institutions in his home town. In 1896 he became associated with the Shepherd-Rust Electric Company, of Wilkes-Barre, an electrical construction and supply concern, holding the offices of treasurer and general manager. In 1919 he was made president of the Wilkes-Barre Willys Knight Company, distributors for the Willys Knight division of the Willys Overland Company, covering a number of counties in eastern Pennsylvania and the northern part of New Jersey. Later he became president of the Union Savings Bank and Trust Company of Wilkes-Barre.

Rust was married in October, 1898, to Edith Maynes Boyd who survives him. His social connections included the Westmoreland Club, Franklin Club, Press Club, Craftsman's Club, Wyoming Valley Country Club, the Elks, and all of the Masonic bodies including the 33 degrees. In his later years he was grand secretary of the Grand Lodge of Masons of the state of Pennsylvania. His great hobby was chess playing, which he followed intensively. During the World War he had charge of the Pennsylvania, Maryland, and District of Columbia War Camp Community Service; was purchas-

ing agent for the Wyoming Valley chapter of the American Red Cross, as well as other War activities. This summer while sojourning at Mount Pocono in Pennsylvania, he was stricken with a fatal heart attack. He had moved his residence last February from Wilkes-Barre to Philadelphia, Pa., from which city he was buried. His body lay in state in the Irem Temple, Philadelphia, where the final honors to Free Masons were performed. Harold Rust's death came as a severe blow to hundreds who knew him as a prominent businessman, bank director, and high Masonic official.

Bill Clafin has changed his residence from the Charlesgate Hotel, Boston, Mass., to 1250 Santa Barbara Street, San Diego, Calif. — LUTHER K. YODER, Secretary, 69 Pleasant Street, Ayer, Mass. JOHN H. GARDINER, Assistant Secretary, Graybar Electric Company, 420 Lexington Avenue, New York, N.Y.

1896

Paul Litchfield was in Boston on October 17, although the Secretary did not have the pleasure of seeing him. He gave an address before the 25th annual National Business Conference and dealt particularly with the National Labor Relations Act, urging its revision to correct some of its glaring deficiencies which had resulted in uncertainty and hesitation on the part of employers. He pointed out that the employer has no right to petition the Labor Relations Board for designation of the bargaining unit, that provision should be made for an appeal to the courts from the decisions of the board, not only on questions of law but on questions of fact, and that means should be provided by which the unit of bargaining may be finally and definitely fixed.

Billy Anderson stopped over in Boston on his way home to Cincinnati, after spending the summer at Biddeford Pool in Maine, and occasion was taken of his presence to have a little dinner at the Engineers Club on Tuesday, October 4, at which Rockwell, Tyler, and Locke had a very pleasant evening with Billy.

Walter H. James of the Department of Mechanical Engineering at M.I.T. has been made professor emeritus this year because of poor health. He plans to continue to live in Waltham and comes in to M.I.T. about every week to keep in touch with his affairs, although he no longer takes any active part in teaching. — Admiral Bakenhus has been made a member of the executive committee of the waterways division of the American Society of Civil Engineers for a five-year term. — Wayne reports that his summer was a rather irregular one and he was unable to get far from Indianapolis for any length of time. He did have a week in Ohio and one in Michigan, and he sees Billy Andrew frequently. To show how far-reaching the effects of the New England hurricane were, Wayne states that 101 linemen from Indianapolis were mobilized and sent into New England, along with several carloads of trucks and equipment, making up a special train.

1896 Continued

John Willis, who is now located in Hartford, Conn., which was one of the big centers of damage from wind and flood, writes that being occupied with the task of getting settled in new quarters he happened to be indoors on that fateful day in a comparatively quiet sector of Sisson Avenue well above flood level. For about half an hour between 4:00 and 5:00 P.M. he was at the window watching the wild gesturing of wind-whipped trees, the falling of broken branches, and the plastering of swirling leaves upon the walls and windows. Some of the big elms that were being mowed down by the hurricane were just around the corner on Farmington Avenue, only 50 yards away, but on account of the noise of the wind he did not realize that these trees were falling. The next day there were astonishing and even amusing aspects to the fantastic deviltry played by the pranky wind upon the stately elm-lined streets. Trees leaned wearily upon houses and other trees and lay across electric cable lines, stretching them taut almost to the breaking point. A tall tree lay prone from the curb clear across the lawn with its top branches and foliage slapped against the front door of a dignified Colonial residence. A huge oak leaned threateningly over a frail cottage, stopping at a 70-degree angle, most fortunately for the cottage.

Con Young and Abby were in Boston on October 15, but unfortunately the Secretary missed them when they called. They were starting their annual automobile trek to Fort Myers, Fla., for the winter and planned to make various stops en route. Con had had a busy summer down on the Cape, working over old records. — Mike Sturm has written from Evanston, Ill., that the business of an architect these days is not so hot, on account of too many speculators and government activities. However, Mike's spirit does not seem to be dampened in the least. — William H. Whitten, who passed away in Jamaica Plain, Mass., on October 5, will be well remembered by classmates as a hard-working, serious-minded individual. He was born in Boston in 1874, son of William H. and Emily I. (Fritham) Whitten. He was married first to Emma L. Beehler in 1912. She died on July 10, 1914, following an operation. He was married a second time to Jane E. Doing in 1916, and she died in June, 1917. He received his degree of S.B. in physics with our Class and remained another year to receive the degree of M.S. in 1897. He held various teaching positions up to 1902. He was in the United States Hydrographic Office up to 1904 and the United States Patent Office up to 1920. He then went with Charles W. Hills in Chicago until 1922 and was with the patent department of the Westinghouse Electric and Manufacturing Company as patent attorney from March, 1923, until he was advised to retire in October, 1935, by his physician. He was very conscientious and methodical in his habits. He kept largely by himself. He was deeply religious and always active in his church, being particularly interested in children and Sunday school. He sent contributions regularly to the missionary

fields in India and Japan and kept in personal contact with these fields by correspondence. He possessed a fondness for travel, and after his health began to fail, about 15 years ago, he spent much time in this way. He preferred the smaller, slower boats carrying few passengers to the large display of the big liners. He had been living quietly in Jamaica Plain, and his last illness was due to a shock. He was ill only three days and did not undergo any suffering.

The death of Percy K. Crocker on May 6 has been previously noted. He was born on November 22, 1871, in Chicago, the son of Davis J. and Frances (Rorer) Crocker. He was with our Class for one year, taking special work in architecture. He traced his ancestry on his father's side back through New England lines and on his mother's side back through Southern lines. One of his paternal ancestors was Jedediah Crocker, who was a minuteman at the Battle of Lexington. His father was a captain in the First Iowa Cavalry in the Civil War. His mother was Frances Rorer, and his grandfather was Judge David Rorer of Virginia. Percy Crocker married, in 1910, Anna MacArthur Frieze. There were no children. He became well known as a newspaperman and advertising agent. He was for nine years with the *New York Sun*. He held executive positions in retail merchandising and sales managing and was with Lord and Taylor in New York City and John Schoemaker in Newburgh N.Y. He was also business manager of retailing with Fairchild Publications. His last executive position was promotion manager for the Bridgeport *Post* of Bridgeport, Conn. He associated with outstanding people in newspaper and advertising lines.

When the United States went into the World War, Crocker, left a high-salaried position to go to the Officers' Training Camp and was in the Army for the whole duration of the War. He saw active service as captain of his company in France. After the Armistice he was officer in charge of handling troops on piers for embarkation at Brest. He was recommended for promotion to major in 1919 when he was holding the position of adjutant to the provost marshal in Paris. His burial was in Arlington National Cemetery. In recent years he had suffered from a breakdown which affected him both in heart and mind and he was unable to attend to business. All his life he had earnestly desired to be a naval officer. His ability to draw caused his family to send him to M.I.T. He himself wanted to go to Annapolis. He had many naval contacts during the War and on his return from France he was a guest of the Navy on the collier *Persesus*. As a student he took part in activities during the year that he was at M.I.T., but in after years his business interests seemed to absorb all of his attention and his contacts with M.I.T. and with his Class were practically nil. — CHARLES E. LOCKE, *Secretary*, Room 8-109, M.I.T., Cambridge, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge, Mass.

1897

On November 1, Archibald L. Parsons, I, rear admiral, civil engineer corps, United States Navy, retired from active service in the Navy and became associated with Frederic R. Harris, Inc., consulting engineers. His new business address is 27 William Street, New York City. We all wish him full success in his new work. — JOHN A. COLLINS, JR., *Secretary*, 20 Quincy Street, Lawrence, Mass. CHARLES W. BRADLEE, *Acting Secretary*, 60 State Street, Boston, Mass.

1899

Clifford M. Swan has done his bit toward filling this column. He wrote me recently of the appointment of Bassett Jones of Meyer, Strong and Jones, Inc., construction engineers of New York City, to the post of engineer in charge of all the illumination and lighting effects for the New York World's Fair in 1939. Jones has designed the spectacular illuminated fountain display which will take place in the central lagoon of the government court. In his spare time — when he is not engaged in professional work or in writing books on economics — he runs a nursery for coastal shrubs and trees at Nantucket. — From Swan, also, came the information that William B. Flynn is living at 827 Marlyn Road, Philadelphia, Pa. — one more name transferred from the missing to the active list. — Swan has been appointed consultant for the New York World's Fair 1939 on all matters pertaining to sound and acoustics. His chief work has been in connection with the design of the large music hall and opera house, the distribution of sound both inside and outside the Perisphere in the Theme Center, the sound effects associated with the great fountain display in the central lagoon, and also the marine amphitheater for New York State.

Burt Rickards wrote me not too briefly nor much at length — while he was confined at the Albany Hospital with a badly infected foot. He said he had worked with germs for a large part of his professional life, but this time they caught up with, and worked on, him. Burt remarked that he had seen the inside of many hospitals but this was his first time as a patient — from the inside looking out as it were — and he hopes it will be the last. He was again in the perpendicular position and waiting to check out when he wrote. Rickards has not neglected his Technology duties: He was the first president of the Technology Club of Albany and served three terms; he has been honorary secretary for the capital district of New York State since the system was inaugurated; and he is one of the lecturers on public health education in the Department of Biology and Public Health at Tech. Leighton, his son, was graduated from the Institute in 1933, Course XV, and is engaged in air-conditioning work with A. F. Hinrichsen, Inc., at 50 Church Street, New York City.

William E. Parker, writing from Fort Lauderdale, Fla., said he passed through Washington during the summer and in-

1899 Continued

tended to stop for a visit, but the weather was so hot that his intentions failed him and he kept rolling northward to escape the rigors of a Washington summer. He knows them of old. He hoped to drop in for a visit on his return, he said, but somebody changed his plans for him. He took a more westerly route to the South and missed Washington. Anyway he said Washington continued hot and humid, as far as he could find out, so he rolled on down to the cooling breezes of the east coast of Florida which he is convinced is more comfortable during the summer than anywhere south of northern New England. — Chester J. Hogue of Seattle, Wash., has been promoting the use of wood as a structural material and, by virtue of glue and various new types of connectors, has produced satisfactory results. — Lawrie H. Turner of Atlanta, Ga., broke a long silence of many years with "How are you, Malcolm?" I told him and asked for news. I have heard nothing more.

When I sent out my last appeal for information about missing members, Harry Mork took time and trouble to see what he could do to locate some of them. This was a courtesy for which I am sincerely grateful. At least we found out where some persons weren't. — Mork tells me he has been associated with the large insurance agency of John C. Paige and Company of Boston for some time. He is doing independent research in the cellulose field and has been called in as a cellulose expert on a number of patent cases. — Herbert C. Greer of the West Virginia News Publishing Company in Morgantown answered my appeal of August 10. He said he had no news because he had been fully occupied in arguing with the C.I.O. — and that was anything but news! Greer plans to attend our 40th reunion provided it is held in some place accessible to Boston.

It might be well to bring up again at this point the matter of the 40th reunion. I received about 20 replies to my inquiry. About 15 members indicated that they intended to attend. The others hoped to but could not say definitely what they would do when the time came. Another bulletin will be sent out shortly.

Frederick Waddell of Bethlehem, Pa., passed through Washington in September en route home. Fred and Mrs. Waddell had been touring through the historic South. On his journeys he looked up several classmates, including Charles A. Smith, Atlanta, Ga.; John B. Ferguson, Hagerstown, Md.; and Bernard Herman and myself in Washington, D.C. For me, he left word (unfortunately I was out of town) that he hoped for better luck next time, as his record for missing the men he called on was 100 per cent perfect. He left further word that he had had a delightful trip, which included among other things climbing Lookout Mountain at Chattanooga, a visit to the Natural Bridge of Virginia, a drink from the Lost River, and a visit to the Saltpeter Caves.

Dudley Pray and Norman Rood continue to impugn my erudition. They claim that I don't read any newspapers—

meaning the New York papers — because, if I did, I would get the news instead of having to appeal to my classmates to know what has happened to one and sundry. This is a moot question. We have had considerable correspondence about it. When is news news? Pray lets me down a bit easy in that he supposes "that the sons of the wild jackasses surround us with so much noise here (which is heard even to the remote corners of the United States) that I can't concentrate on current news." Maybe so! But I would rather get my information at firsthand than crib it from the dailies.

I regret to announce the serious illness of Edwin H. Hewitt of Excelsior, Minn. — On August 24 William H. Newell, President of the Bath Iron Works — Stark to the Class of '99 — was commended by Governor Barrows for the successful management of his shipyard. The governor was making inspections of various manufacturing and other establishments engaged on large construction programs. Newell is building ships for the Navy at his shipyard. Good ships! Bath is flourishing. So is the shipyard. — W. MALCOLM CORSE, *Secretary*, 1901 Wyoming Avenue, Northwest, Washington, D.C. ARTHUR H. BROWN, *Assistant Secretary*, 53 State Street, Boston, Mass.

1901

Since the class notes for the November Review were sent forward to the Editors on September 21, which, incidentally, was the day of the big hurricane (demonstrating that "it can happen here" and that windstorm insurance is really needed in New England), your Secretary was most delighted to have a visit with Al Higgins who stopped at Hartford on his way back to Florida following a vacation trip to New England and Canada. While in Nova Scotia, Al stopped at Halifax and had a visit with Fred Sexton, who is the president of Nova Scotia Technical College. Al said that Sexton, whom neither he nor I had seen for many years, is doing a mighty good job and that he hoped he could come to the next reunion so as to tell us of his interesting educational problems at Nova Scotia Technical College. As regards himself, Al admitted that while he knew he was not so young as in 1901, he is still going strong and is looking forward to a busy year in Florida as president of the Florida Power Corporation. Al seemed to think that business conditions were somewhat better and hoped the national administration might give the utility business a real chance to make progress. As stated in the November notes Al makes his headquarters in St. Petersburg, Fla., and he told me that he would be delighted to have any of the fellows who can get to Florida this winter or any other winter come to St. Pete and make him a visit.

According to the newspapers, Lammot du Pont made a very fine address at Boston on October 20 at the 23d annual banquet of the Associated Industries of Massachusetts. The newspapers indicated that Lammot felt taxation, labor legislation, and the administration of all laws affect-

ing employment should be taken out of partisan politics. "Taxation," he said, "is too great a power to entrust to any one man, to any one class, to any one faction, or even to any one party. It is a power conferred by all the people, which affects the lives of all the people, and it should be exercised in the interests of all the people in full daylight. Therefore I see only one ultimate solution. Taxation should be taken out of partisan politics." He argued similarly as to labor legislation and administration of all laws affecting employment, because, again "the common good is involved." He also pointed out that taxes are a fixed charge on business and that the governmental expenditures for 1938 are fully 12 times those of 1900; that the total government debt is now 20 times larger, and that expenses of government in the United States are estimated at \$560 annually a family. He indicated that there were so many forms of taxes that the cost of completing the forms alone amounted to many hundreds of millions of dollars annually. In conclusion, he enumerated the program of present-day business to include "the lowering of costs of all raw materials that enter into living; maintenance of high wages; improvement in the quality and usefulness of all existing goods and the development of wholly new materials and new goods through scientific research and invention; the creation of new tools, new equipment and new power facilities — new capital added to that which we now have — in order to provide full employment not only to the present generation but also to increasing future generations." We may all be sure that Lammot du Pont is following out all of his own suggestions for his own company which has many times demonstrated that increased production of better articles at less cost is infinitely better than restricted production and the maintenance of high prices without any real advantage either to the producer or the consumer.

Your Secretary recently had a post card from Paul Hilken, who spent his vacation at his sister's ranch out in Colorado, which he described as being "God's own country." He said he felt years younger because of his visit, so shall look forward to receiving other suggestions for better health when we next meet in New York.

On October 19 your Secretary was in Springfield, Mass., and had the pleasure of lunching with Ted Lange and Ed Robbins. Ted Lange was Course I and since his Tech days has traveled rather extensively all around the country but is now settled at Springfield and evidently takes great pleasure in supervising, with his brother, some rather extensive real estate holdings. Ted's outlook on life is, therefore, decidedly philosophical, and even though he may have Democratic leanings, I believe that he might be induced to vote sometime for a good Republican, and we all know there are a lot of that kind, as well as many good Democrats. Ed Robbins, who was a naval architect, also described rather extensive

1901 Continued

travels around the country, but for several years has been making his home in Springfield following a very serious accident which befell him in connection with some ranching which he did out in the West. Both Lange and Robbins were very modest in telling about their various adventures and, in fact, that would seem to be a general tendency. However, I have an idea that if the truth could be known about a lot of those same adventures, more interesting stories could be developed than are being used by the moving picture industry.

The Alumni Office advises that the present address for Herbert H. Kennedy is P. O. Box 1312, East Hampton, N. Y. We haven't heard from Kennedy in many years and would be glad to receive some comments even though we cannot have the pleasure of a personal visit. The Alumni Office has also sent in the sad news of the death of Henry Marcus on September 6. There was no additional comment; so we have written to Perk Parrock at San Francisco, where Marcus lived for a number of years, and hope that Perk may in due course be able to send us some additional information. — ROGER W. WIGHT, *Secretary*, The Travelers Fire Insurance Company, 700 Main Street, Hartford, Conn. WILLARD W. DOW, C.P.A., *Assistant Secretary*, 20 Beacon Street, Boston, Mass.

1902

Your Secretary has received notice of the death of our classmate, Charles A. Smith, and the following sketch of his activities is furnished by Professor Locke '96 and is much more complete than our class records: "Charles A. Smith, mining engineer, who died of bronchial pneumonia at his home in Los Angeles, Calif., on August 6, was widely known in the engineering field. Born of New England parents in Oconto, Wis., on September 15, 1879, he attended school at Phillips Andover and was graduated from the M.I.T. in 1902. He soon went to Durango, Mexico, and later joined the staff of the Moctezuma Copper Company at Nacozari, Sonora, Mexico, serving as superintendent of mines until 1908 when he was made assistant general manager. Smith held that position until he joined the Caucasus Copper Company in Georgia, South Soviet Russia, as mine manager in April, 1914. Officials of the company were driven out by the Turks in the fall of 1914, and Smith finally arrived in England the following February via Tiflis, Baku, Moscow, Petrograd, Finland, Sweden, Norway, and the North Sea. He immediately offered his services to Herbert Hoover . . . in Belgium.

"In May, 1916, he went to Ray, Ariz., as superintendent of mines for the Nevada Consolidated Copper Corporation, later became assistant general manager, and for the two years prior to his resignation in June, 1929, he served as general manager. He entered consulting work and remained in that field until about a year ago when he became manager of the Picacho Gold Mining Company in Los Angeles."

Friend announces the arrival of a granddaughter, Elizabeth Cilley, born September 30. The young lady is doubly blessed as her father is Putnam Cilley '29. — BURTON G. PHILBRICK, *Secretary*, 246 Stuart Street, Boston, Mass.

1903

Your Assistant Secretary, who is responsible for these notes, was in Vermont from September 20 to 28, during and following the hurricane which swept over New England on September 21. Because of blocked roadways and interrupted train service he was unable either to get in touch with the Secretary in Boston or to submit the class notes by the 24th, the date they were due. There were so many items of interest to the Class that we are sorry it was impossible for them to appear in the November issue, but by special permission of The Review Editor they are printed in this number. Probably we should start with the oldest in point of time and work forward. Our last notes were written just previous to our 35th reunion and Alumni Day. We had a fine week-end at Coonamessett in spite of the rain. Coonamessett is an ideal place for a class reunion, providing a golf course, tennis courts, boating, bathing, and sailing; the cottages and inn provide ample space to house a large crowd comfortably; and it is only a short ride from Boston. The following men of the Class came: C. S. Aldrich, Ancona, Bradshaw, M. H. Clark, Cushman, F. A. Eustis, Fales, Gould, C. F. Green, G. M. Greene, Haddock, Haskell, Jackson, Joyce, King, Latham, Nutter, Regestein, Ruxton, and Stiles. The following wives were present also: Mesdames Ruxton, Nutter, Eustis, Gould, Stiles, Joyce, King, Haddock, C. F. Green, Fales, and Latham, making a total of 31. Ruxton managed a successful golf tournament in the rain, at which the prizes were sufficient in number to make all of the contestants happy. Most of the time was pleasantly occupied in renewing old acquaintanceships, recalling past events, and questioning, "Where is so-and-so?" — "Who has heard from . . .?"

At the business meeting the Secretaries reported on their activities, votes of confidence were given, and the same two men were elected to continue in their respective jobs. Telegrams of congratulation and good wishes were sent to the Classes of '88 and '13, both of which were holding their own special celebrations elsewhere at the same time. Some members of the Class enjoyed a delightful sail on Vineyard Sound, and two tables of bridge brought one day to a satisfactory conclusion (for two couples anyway). King sang in his old pleasing manner, and Ruxton was a continual source of amusing song during Saturday night's dinner. The party broke up Sunday after luncheon, some of the crowd returning home and others going to Boston to attend Alumni Day events on the next day. The following men attended one or more of these: Regestein, Ancona, Denham, Danforth, Cushman, Haskell, Bradshaw, King, G. M. Greene, Joyce, and M. H.

Clark. There were nine at the banquet at the Statler Hotel. The class reunion was planned and carried out with the help of George Greene and Chester Aldrich, assisted by a committee of ladies headed by Mrs. Eustis. Everyone present wanted to hear about absent men. Those of you who were not there were missed. Hope you will be able to make the next one. The only sad part of the reunion was the news of the deaths of several men that either had occurred recently or else the news had not reached the Secretaries. Of these we will write next month, together with some cheerful news that will keep. — FREDERIC A. EUSTIS, *Secretary*, 131 State Street, Boston, Mass., JAMES A. CUSHMAN, *Assistant Secretary*, 441 Stuart Street, Boston, Mass.

1904

It is now some time since summer departed in a terrific gale of wind which nearly ruined the New England States. I sincerely hope that all my readers had a pleasant and profitable season and that none suffered any injury to himself, family, or property as a result of the catastrophe which occurred on the evening of September 21.

The annual class reunion was held on June 24, 25, and 26, starting with a luncheon at the University Club, at which were present Kendall, Ferris, Parker, Fellows, Stevens, Thurlow, Dennie, and Fairfield. Almost every year now, some classmate appears at a reunion for the first time, and this year it was George Fairfield, who was the first Tech man to play a bass horn for the freshman band. The delegation going down to East Bay Lodge on Friday afternoon was limited to Kendall, Parker, Fellows, Fairfield, Stevens, and Jack Draper, but Ferris and Gus Munster arrived during the evening, and Gene Russell showed up Saturday afternoon. We missed Mert Emerson and General Holcombe again this year. Business cares kept them away. The last arrival was Phil Sweetser, who came Sunday morning driving a new model automobile — a seven-passenger *three-door* Buick sedan. This received a great deal of attention until Phil explained that anybody could make one by driving into a narrow garage doorway with one of the rear car doors open. Although our numbers were smaller than in years past we all enjoyed the get-together as usual and hope for a larger attendance next time.

I have not a great deal of news to offer this month. Harry Groves dropped into my office for a half hour's chat one afternoon last summer. He was on his vacation from Washington, D.C., where he is connected with the Interstate Commerce Commission. — I had lunch sometime in August with Bill Anthony and Mrs. Anthony. They are engaged in the real estate business in New Bedford. — I have received a couple of address changes indicating that Bill Evans has left Atlanta, Ga., and gone to Detroit, Mich., and that Selskar Gunn had returned from Shanghai, China, to New York City and then gone to Paris, France.

1904 Continued

I have received notice that Frederick L. Higgins, long connected with the Eastman Kodak Company in Rochester, N. Y., died on May 21, and that Ernest C. Levy died on September 29 at the William Byrd Hotel in Richmond, Va., where he had resided for some time.

Next June marks the 35th anniversary of our Class, and we hope to have a large number present at our reunion. Start thinking about it now, and if you have any ideas which you think would make it more successful, let me know what they are. — Merry Christmas and Happy New Year. — HENRY W. STEVENS, *Secretary*, 12 Garrison Street, Chestnut Hill, Mass. AMASA M. HOLCOMBE, *Assistant Secretary*, 4817 Woodway Lane, Northwest, Washington, D. C.

1905

The story of the sudden and untimely death of Ralph LeRoy Segar, VI, can best be told in the words of Frank Payne, XIII; "On August 16, Ralph Segar passed away at Westerly, R.I. I received a telegram from Mrs. Segar and hurried on to Westerly to see if there was anything I could do. It was a great shock to me because I always felt that Ralph had a fine constitution. It seems his heart gave out on him, very suddenly, and he passed along in the night. Ralph had a wealth of fine friends, and all the leading citizens of Westerly turned out to pay their last respects. As you perhaps know, Ralph was my best friend at Tech; and I stood by until it was all over. I also arranged to have some lovely flowers come in the name of the Class. Somehow I felt like the representative of the Class. Never in my life have I seen such lovely flowers and the sweet sincerity of Ralph's neighbors and townspeople. Besides Mrs. Segar there is Stillman, a boy of nine, and Judie, a girl of 13, who are left to carry on. Ralph was, of course, tops in his profession in Rhode Island and made many important and successful power installations in some of the most prominent mills in that section. Without a doubt he left his family very well fixed for the rest of their lives. We shall all miss Seg greatly. It is a great loss to me personally." — Thanks, Frank, for standing by. The Secretary did not know of it until you telephoned as you returned via Boston. A letter expressing the sympathy of the Class and our appreciation of Ralph's manhood was sent to his widow. We missed his customary Sunday afternoon visit at Old Lyme this year but look back to many happy relationships with him.

To Bill Motter, III, and Ros Davis, XIII, we are indebted for reports on the equally sudden death of Herbert Mygatt Wilcox, X, on July 28. With Bill's letter came a clipping from the *New York Herald Tribune* which we are quoting in part on account of its completeness: "Herbert Mygatt Wilcox, vice-president of Westinghouse Electric and Manufacturing Company and one of the pioneers in the development of talking pictures, collapsed and died of a heart attack at 12:45 P.M. yesterday at Trinity Place and Thames Street. He was fifty-six years old.

Mr. Wilcox, who was in charge of the new products division of the Westinghouse company, was walking with George C. Brown, also of the firm, and Fred Pascal, of 264 East Twenty-ninth Street, when he was stricken and fell to the street. Patrolman Joseph Walsh summoned an ambulance from Broad Street Hospital, but Mr. Wilcox was dead when the ambulance arrived. Officials of the Westinghouse company said that Mr. Wilcox, who made his headquarters in East Pittsburgh, Pa., was in New York on business, having passed the morning in the Broadway offices of the firm. Appointed manager of the newly created division of the Westinghouse company nine months ago, Mr. Wilcox was said to have played an active part in introducing the Westinghouse Precipitron, an electrostatic air cleaner, which is expected to revolutionize the air-conditioning industry. Mr. Wilcox was formerly vice-president of Electrical Research Products, Inc., a subsidiary of the American Telephone and Telegraph Company, which led manufacturers in the production of sound motion picture equipment. Mr. Wilcox was born in Pittsburgh on November 6, 1882. He attended Princeton University from 1900 to 1902, transferring to Massachusetts Institute of Technology, from which he was graduated in 1905 with a Bachelor of Science degree in chemical engineering. In 1914 he joined the Winchester Repeating Arms Company and served as an industrial engineer until 1925, when he became commercial manager of the Western Electric Company. He was promoted to vice-president in charge of operations the same year when the latter company created Electrical Research Products, Inc. It was during his ten years with the E.R.P.I. that Mr. Wilcox rose to prominence in the field of sound motion picture development. He was credited with much of the success in the production and the installation of the first talking picture equipment. In 1936 Mr. Wilcox became associated with Paramount Pictures Corporation, but left after a year to join the Westinghouse organization. He made his home at 200 Edgehill Road, New Haven, Conn. He was a member of the Princeton Club of New York, the University Club of Pittsburgh, the New York Electrical Society and the New Haven Country Club. Surviving is his wife, Mrs. Frances Jaynes Wilcox, whom he married in 1909. They had no children."

Ros sent the same clipping and added: "I knew Herb, or Sox, as his intimates called him, pretty well when we were in school. But I knew him a lot better when we roomed together in Newark for a year while we were both working for the Singer Manufacturing Company in the Elizabethport factory. A few years later, when he was in Tryon, N.C., I stopped off and spent a day with him. I shall always remember his taking me, one hot night in about 1928 in New York, to the only theaters showing sound motion pictures. In one of the three, we went into the projection booth, spending some time over the complicated system then in

use. One of the shows was the famous 'Jazz Singer' with Jolson. The other programs were composed of vaudeville acts and orchestras. His acquaintances will remember him as a hustling enthusiast with a gentle manner and delightful sense of humor."

The reunion (33d) at Old Lyme was another grand social success. Present were McLean, Strickland, Ball, Fisher, Shapira, Buff, Gilman, Boggs, Bell, Marcy, Kriegsmann, Bennett, Davis, Kenway, Jones, Fouhy, Robbe, and Goldthwait. We would like very much to accept in full Andy's report of the reunion, but these notes have been so full of quotations thus far that we will merely use Andy's notes on the poetical and sentimental phases, with here and there interpolations on the political: "Boxwood Manor was right on top with iris, poppies, and many other flowers at the height of their beauty. The acres of lawn and garden were never prettier. Robins, catbirds, orioles, song sparrows, and many other songsters found one crowd wide awake to enjoy their melodious song. Old Lyme itself is curiously interesting. Many of the old houses were built 200 years ago by old sea captains. Most of the houses have been preserved. . . . Jim Barlow and George Jones made their first trip to Old Lyme, making our total for the four years 62 men and a dozen wives and sweethearts, who repeat yearly because they love the place. Anyone who likes birds, flowers, beautiful well-kept lawns, and the old houses and top-notch food and plenty of it, better get acquainted with the Class of 1905." (Note: The advertising manager will be charging Mine Host Dows for space.)

We digress a moment to give you the latest news from Old Lyme, which will be interesting to those 62 men and 12 wives (the word sweetheart is superfluous). Ros Davis writes: "Perhaps you have heard that we had a little hurricane around here. Maybe you got a bit of it your way, although news from Boston in our local papers and the New York papers has been slight. Our campus [Wesleyan University] took a beating. Of the 50 big elms and maples on the main campus, 15 remain, and some of these are damaged. The chapel steeple crashed through the roof, and there was other roof damage on other buildings. I stood in South College and watched the trees wave and strain and finally fall. I saw the steeple crash. We thought we had been through something, but after a trip to the shore, I realized that we came out of it rather lightly. The wreckage along the Connecticut shore from New Haven to Point Judith, cottages and boats, is beyond belief. Only a small part of the story has been written. The condition of Old Lyme, where we have had such lovely reunions, makes one weep. So many of the beautiful trees are down. Boxwood Manor got its share. All the big trees in front are gone as well as many of those around the gardens. Evidently trees struck the house, for roof repairs are in progress. But the main house and the 1905 cottage are intact. . . ."

1905 Continued

The Saturday night fireside talk outdid most of the previous ones in friendly animosity. Unanimous were all present in regard to the plan of moving Rogers Building bodily to an appropriate place on the campus at Cambridge, and a resolution to this effect was adopted and sent to the "powers above" with the suggestion that we have a "restoration" architect in the Class (Strickland) with well-developed ideas as to the possibility and sanity of the project. The Class expressed itself as decidedly against the proposed alternative of moving Rogers Steps and a broken column. Acknowledgement was received with thanks and ice water. A project was advanced to create a fund so that any member of the Class able to get to Old Lyme for the 35th reunion in 1940 would have his expenses subsidized while there. The idea was well received and a committee consisting of Boggs, Strickland, and Goldthwait appointed to put the plan into effect. Ros Davis had to leave hurriedly to put Wesleyan to bed, but before he did, he protested vigorously a recent publication in *Life* portraying an M.I.T. student's room with signs "Tech is Hell" and various nudes on the wall. After due discussion and on motion by Davis, it was voted to send *Life* a vote of thanks for such correct delineation (Middleton papers do not copy).

As usual Ray Bell telegraphed Friday from Chicago that he was held up on account of important business. As usual on Saturday, Ray and Mrs. Bell showed up in the harbor in the good schooner *Yankee*. This meant another enjoyable ride on Long Island Sound, Sunday. Thanks to the skillful helmsmanship of Boggs and Buff, all buoys were picked up by the stop-and-touch method, and with gentle hints from Skipper Bell the harbor was found on the return, same day. Much golf was played with the Strickland-Boggs team taking Ball and Barlow into camp at the pro's course in New London. There was one more bag of clubs; so Marcy, Buff, Shapira, and Goldthwait zigzagged the course at Old Lyme. Nobody could tell who won. Marcy lost the most balls; Buff walked the farthest; and Shapira drove into the most cemeteries. In fact once when Sam lost a ball it was finally found resting close to a tombstone marked "Samuel Beckwith, died 1845." Shapira was so tired after his strenuous 7½ holes that he said: "Move over, Sam, let's us old Sams lie down together." That's all except that we voted to return to Old Lyme for our 34th on June 2, 3, and 4, 1939.

An interesting side light to the reunion was a telegram received on Saturday from Willard E. Simpson, I, of San Antonio, Texas, addressed to Roswell Davis, Secretary. Maybe it was sent in 1935 when Ros was secretary. We suppose it does take some time for election news to get "way down thar." Anyway, Simpson said that he was attending the graduation of his son, Willard, Jr., at Texas Agricultural and Mechanical College, that for 33 consecutive years he had wanted to reunite but each time a disappointment

came. He said also: "On July 1 my other son, Radcliffe, enters West Point; so if he succeeds in staying there I may see you in 1940. I, too, vote to save Rogers, and while I haven't subscribed to the new gym at M.I.T., I intend to and will heartily subscribe to save Rogers. I wonder if any of you fellows would know me if I dropped in on you suddenly. Gee, how I wish I could." — Thanks, Willard, for everything. We have your reservation made for 1940.

At the Alumni Day Dinner, 1905 had one of the largest delegations of any Class within ten years either way. There were present Charlesworth, Fisher, Gammons, Babcock, Jones, Keith, McLean, Lewis, Newlands, and Goldthwait. Newlands, XI, brought over to our table and proudly introduced his son, who had that day been graduated in the Class of 1938.

July 29 was, apparently, 1905 Day in Boston. After seeing Harry Wentworth at his office, I met within a space of two hours and a radius of one-quarter mile Ed Barrier (thanks for the lunch), Marcy, Kenway, Fred Abbott, Strickland, Fisher, and Shapira. And Harry had just been talking to me about 1905 matters and afterwards of his pet hobby — cosmic relationships.

Prince Crowell says that thanks to the advice obtained at Professor Keith's Naval Museum last spring, he won the first boat race of the season at Woods Hole, Mass., in June. Andy says his (Crowell's) daughter, Persis, deserves the credit, for she sandpapered the keel to a knife-edge à la Professor Owen '94. Prince had an odd experience as a result of the hurricane in September. He had three boats moored in front of his summer home. After the storm he went to Woods Hole in fear and trembling, but found nine boats including his own and Bob McLean's which came over from Monument Beach on the tidal wave. The other five are donated to Admiral Fisher of the 1905 Navy. — Bob Young has been prospecting for gold in northern Ontario. He autoed to Hudson Bay, canoed from there to the gold fields at Cochrane, and after making his strike used up all the pay dirt in flying back to the States.

E. J. Poor, VI, chairman of the board of directors of the Hygrade Sylvania Corporation, Salem, Mass., was married to Dr. Grace M. Hebor of Brookline on Wednesday, August 10. — E. Logan Hill, II, whose permanent address is Box 253, Lincoln, Ill., and whose winter home is at Miami Beach, started for the 33d reunion but didn't make it. Perhaps he found a summer home en route. How about it Logan? — Jim Barnes is rediscovered. He is vice-president and general manager for the Mobile Light and Railroad Company, just as we supposed he was. Our mail to his supposed home address apparently was not sent to the office, or he never went home, or something. Perhaps we'll get a rise out of him now.

Number 1 traveling correspondent, Clarence E. Gage, sends us reports on calls made to interview three more "hidiers." He found Ida Annah Ryan, IV,

at Orlando, Fla. She has been in Florida since 1920, doing architectural work, mostly at the time of the boom. Between the time the boom burst and the depression, she and her partner bought a 20-acre orange grove and are operating it. Clarence found F. M. Blount, IV, at Pensacola. After graduation Blount worked in Boston for a while, then settled in Pensacola. He did three million dollars' worth of business (architecture) the first two years, including the San Carlos Hotel with 400 rooms, also the Blount Building. In 1914 he entered the contracting business. During the War he operated a shipyard with 300 to 400 men, built 200 ships for the United States government, later two for the Norwegian government. For the last seven years he has been in the stock and bond business, with offices in near-by cities. Gage's next assignment was Little Rock, Ark., which he took in stride — en route to Denver. At Little Rock he called on Walter L. Whittemore, III, who had been transferred from Zanesville, Ohio, very recently. After five years in mining, Walter went into the Government Reclamation Service. After 16 years he was afflicted with sinus trouble and was transferred to the Engineer Corps of the War Department, where he now is. His present work is on flood control of the Arkansas River. He maintains his home at Memphis, Tenn., is married, has two daughters and one son; also three grandchildren. The boy is entering medical school. Gage continues: "Whittemore is a little stout, though no more than is to be expected of men of our age. Like me he has a full head of hair. There the resemblance ceases. He shoots golf in the low 80's or upper 70's and plays 18 holes every Saturday and 36 on Sunday. He is an iron man on driving (automobile), too. He very casually mentions driving 24 hours continuously, and when transferred from Zanesville, he made the trip to Memphis without stopping. We left him at 8:15 P.M., and he was driving 138 miles that evening to Memphis for a week-end visit with his family. He had a severe attack of arthritis about 20 years ago but is entirely cured now; so perhaps there is hope for me." — Thanks, Clarence, for your faithful interest in your classmates. Wish you were quite.

Fred Poole, VI, writes (no charge for the advertising): "I have just come up for air, after an intensive three months getting Poole and Company going — a 'new face on the old cat.' I hope this will be accepted by you as sufficient excuse for not doing the things I should have done, which you requested. The enclosed description of the Week-a-Month Plan will give you some idea of what it is all about — a partnership of consulting management engineers. I solicit your patronage and will also appreciate your telling your friends about it, is a part of the plan. It is our philosophy to try to avoid broadcast advertising; being fundamentally sound, our business will continue to grow, using the more conservative promotion." The prospectus attached to his letter shows an interesting

1905 Continued

study of, and approach to, this plan of management counsel. Write to Poole at 427 Audubon Avenue, Audubon, N.J., if you wish details.

John A. Meggison, II, writes, confessing that he has never responded to our class interests or seen a classmate since graduation. He is with the Empire District Electric Company, Riverton, Kansas, and his past 33 years have been devoted to a great variety of electric contracting problems. He is married and has an adult daughter.

Milton L. Rubel, III, in place of a history or story of his life, and so on, burst into poetry. What's the matter, Milt? No family, no honors, no hobby, not even a sailboat? — John T. Glidden, III, wants to buy a 1905 Portfolio so he can see what the Secretary looks like. Honest Injun. Has anyone a duplicate or one he wants to sell f.o.b. New York, crated for shipment to Peru?

Strickland sends in a reprint from the Boston *Evening Transcript* of August 27, showing a conjectural west and south elevation made in the office of Strickland (Sr.) and Strickland (Jr.) of a home built in Kingston, near Plymouth, Mass., about ten years after the arrival of the *Mayflower*. The sketches were made after Sid, commissioned by the Howland Society, had at the end of a year of careful excavation discovered what is believed to be the cellar of Pilgrim John Howland's home. It is a very interesting article and study, and just one more page in Sid's book of archeological and restoration work.

We hate to drag Andy Fisher into the limelight again, but this isn't about Andy. His oldest daughter, Anne, the one we have heard so much about because she is the oldest, was married to Byron Reidt Hanke in London, England, on Wednesday, October 12. Mr. Hanke was graduated in 1933 from Colgate University where he was a member of Phi Beta Kappa; he received a degree in landscape architecture from Harvard in 1937. He now holds the Charles Eliot Travelling Fellowship. Mr. and Mrs. Hanke will travel in Norway and Sweden, returning to this country in January. We do not need to go into detail about Anne; Andy has told you everything. — FRED W. GOLDTHWAIT, *Secretary*, 274 Franklin Street, Boston, Mass. SIDNEY T. STRICKLAND, *Assistant Secretary*, 75 State Street, Boston, Mass.

1906

The following letter from Cy Young speaks for itself: "Your note in the July Review, advising as to your failure to receive postals from Florida last winter, on top of a short visit I had with A. B. Sherman two or three weeks ago in Boston at one of President Compton's dinners, gives me a thought. I discovered that A. B. was staying a few miles from where I was staying in Florida last winter, but, of course, I did not know it at the time. Doubtless, a number of our classmates sojourn there, many perhaps at the same time and some at the same places. It would be a simple matter to get

in touch with each other if we knew who, when, and where. Why not invite this information and publish it in, say, the December issue? As for myself, I will be at the Boca Raton Club, Boca Raton, Fla., for a week or two starting about January 20, and my whereabouts from then on until I leave can always be ascertained by communicating with the above club. This may give an opportunity to some of us residing at a distance from Boston, and other centers, to see some of the crowd whom we might not otherwise have the opportunity of seeing."

To this the Secretary replied in part as follows: "I think your idea is an excellent one and I will try to get a list of the men who expect to be in Florida for the December Review. Ralph Patch and Henry Ginsburg are annual visitors. Whether Abe Sherman intends to go next year I do not know at this writing. In this connection, I have just received an address change as follows: Ralph N. Soule, 1140 Southwest 13th Court, Miami, Fla. Soule was a Course VI man whom I have not seen since graduation. I have had six addresses for him since 1913, and therefore conclude he has been quite a rambler." If classmates will notify the Secretary of their Southern addresses, we shall be pleased to act as a clearing house in accordance with Cy's suggestion.

Alumni Day was held on June 6, but as we have had no chance to report the doings previously, a few words regarding '06 attendance may be in order. Those who attended the outdoor luncheon were Ned Rowe and Mrs. Rowe, Henry Ginsburg and Mrs. Ginsburg, Abbott, Coey, Hinckley, Philbrick, Abe Sherman, and the Secretary. The dinner in the evening was attended by Abbott, Ginsburg, Hinckley, Kidder, Nash, Philbrick, Rowe, and Abe Sherman. Our table also enjoyed the presence of Charlesworth '05, who could not find room with his own delegation. Cy Young was in Boston the night before Alumni Day in order to attend President Compton's dinner to the regional representatives but could not spare the time to stay through Alumni Day. Abe Sherman was also in attendance at this same dinner, as may be noted from Cy's letter. The Ginsburgs were particularly interested in this year's celebration as their son, Stanley M., received his B.S. degree from the Institute in June.

The Secretary is able to report that Ray Philbrick and wife and daughter, Annette, spent the month of August at Groton Long Point, Conn., as Mr. and Mrs. J. W. Kidder enjoyed a very pleasant week-end with them the middle of that month. Ray is an enthusiastic powerboat yachtsman and, as owner of a 38-foot cruiser, he is much interested in navigation. Ray has also cultivated the hobby of color photography and has some very interesting pictures taken on a trip to Hawaii last year. One in particular shows Sid Carr and Bill Furer planting an '06 tree somewhere in this island territory.

This notice, clipped from the Boston *Herald* of June 7, is of interest: "Mr. and Mrs. Ralph R. Patch of Stoneham announce the engagement of their daughter,

Miss Charlotte Patch, to Mr. Earle L. Sims, son of the late Mr. and Mrs. William F. Sims of Harwich. Miss Patch received her Bachelor of Music degree from Hollins College in Virginia in 1931. Mr. Sims prepared for college at Phillips Exeter Academy and was a member of the class of 1931 at Harvard. The wedding will take place in the early fall and Mr. Sims and his bride will live in Harwich."

The Secretary regrets to report the passing of another classmate, Elmer E. Harrington, III, who died at South Berwick, Maine, August 2. The following notice is taken from the Boston *Globe* of that date: "Elmer Ellsworth Harrington, prominent Springfield, Mass., chemist, died at the home of Joseph A. Neal here this morning in his 59th year. He had made his home in South Berwick since September. For more than 20 years, Harrington had served as chief chemist and metallurgist for the Bausch Machine and Tool Co., of Springfield. He also had worked in Montana for the Boston and Montana Mining Co., and in New Jersey for the U. S. Metal and Refining Co. Born in Malden, he was a graduate of the M.I.T. Survivors include his wife, Mrs. Bertha Milliken Harrington, one son, Ellsworth C. Harrington of West Springfield, his father, Edwin D. Harrington of Malden, and two sisters, Miss Mabel B. Harrington of Malden and Mrs. Henry Morgan of Wakefield. Funeral services will be held in South Berwick Thursday afternoon." — JAMES W. KIDDER, *Secretary*, Room 802, 50 Oliver Street, Boston, Mass. EDWARD B. ROWE, *Assistant Secretary*, 11 Cushing Road, Wellesley Hills, Mass.

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Sam Very's letter, begun in the November Review, continues: "As San Luis Potosí has been much in the news lately, perhaps you will be interested in my first impressions there; they are quite different from friendly predictions which had pictured the town as a rich mining center with up-to-date hotels and a rather Communistic outlook. The greatest holiday of San Luis Potosí's year is November 20, in commemoration of Madero's successful revolution in 1910 which overthrew the Grand Old Man, Diaz, and his plutocracy. My train crept into the black station on the 19th, at night, and was met by thousands of huarached, blanketed mestizos, for aboard was the greatest living hero of the town, a native bull-fighter. He was destined to enter into my life presently because, stranger to the customs, I took, as I thought naturally, a particular vacant seat in the jitney which was to whisk us both to the same hotel. I did not keep that seat long; I was invited by the driver himself, no less, to give way to greatness, and though greatness, with Castilian élan, waived claim, chauffeur would hear none of the disclaimer. Not knowing at the time the significance of all this seniority, I was still more puzzled to be denied admittance to the principal hotel which was jammed with fight fans, but destiny was good to me, and I was escorted by a plenitude of

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porters, hotel agents, and interpreters to the very hotel of the hour, the one chosen by the hero who had taken my seat. There, there was 'just one room left, señor; but, a thousand pardons for the necessity, it is in the bridal suite and cannot, as it were, be truncated from it.' I caught the point; this or a park bench. And though I groaned at the (to a New Englander) extravagance, steeled myself to hear the low-down. It comprised two rooms 'and bath.' Alas, 'American plan' — by which was meant here three vast dinners each day — plus bed, plus board, plus service, plus the free, gratis use exclusively of the entire bridal suite, including the borrowed light of the illuminated street signs, plus the 'bath' — a total of five pesos per diem per capita, or the then equivalent of \$1.40 American!

"Calculating that the honor of being domiciled with the hero of the town would alone be worth that, I gratefully went to bed but not before a prudent inspection of the appurtenances of the bridal suite, which I later heard was the most luxurious in the town. The floor boards were unpainted; the beds were of the first vintage type — having springs, limber in the geometric center and padded slightly. It took much eloquence to secure another blanket beyond the cotton one already there, though I had been promised 'all you want.' The private bath turned out to be a curtained alcove about four feet square in plan, having a 11- or 12-foot ceiling, in the center of which was suspended a cold-water pipe with sprinkler at the end — the shower. This must of necessity sprinkle the other two fixtures of the room but didn't because there was no water running at night, ever, as the pressure in San Luis Potosí was insufficient, and already things had reached the growling state among the natives.

"The town being, as I expected, a Communistic center, I was much surprised next day to visit the verge of an open-air meeting going on in the square, where a hot orator was haranguing a cool, almost stoical crowd about the virtues of Mussolini, Franco, and Hitler, from a bandstand draped in the intertwined colors of their countries and that of the republic of Mexico. My astonishment increased as I entered church after church where religious instruction or Christian services were going on without the slightest interest by authorities. At this time, of course, General Saturnino Cedillo was not the Wild Bull of San Luis Potosí nor had the archbishops of Mexico and Guadalajara held their love fests with the Wild Bull's President Lazaro Cardenas, whom they now call Savior of Mexico, though the Wild Bull calls him a puppet of Stalin's.

"It was at San Luis Potosí that I obtained my first serious disillusionment about Mexico: It was not the propaganda which throughout that country exuberantly misrepresents, as it does in other countries; it was not even the fear that after so long a journey I was going to see no Indians or anything else of the primitive in this land of Mayan culture,

Toltec industry, and Aztec expropriation; it was the need to watch out for germs, for doctors, and for indifference to their joint contagions on the part of informed natives. To be sure, I had already begun to suspect that all the pretty tales I had heard and read of the lures of this land are travelogues gotten up by quite unscrupulous politicians who like to handle American gold and by transportation thieves in connivance with them. I had witnessed already the cheap character of the baubles sold at station sidings by blue-jeaned half-breeds whose only fierceness seemed to be the fight in the terrible aniline colors of their brand-new serapes, slung over one shoulder by day or worn poncholike by night. I had learned by now that even the City of Lakes, where I was bound, no longer had lakes, no longer was thought even by the unscrupulous politicians and transportation thieves 'the most beautiful city in the world'; and I had sadly crossed off all hope of seeing any of the loveliness of scenery of Aztec days if the desolate samples already experienced in the middle mesa were criteria. But I had not yet experienced the water. Let me assure you, St. Nicholas: If you travel anywhere in Mexico, you must take along many boxes of chlorination pills, safe ones — good for billions of typhoid germs — small ones that you may tuck into your vest pocket and use incessantly, for without them you too will wonder what has got into you, and you too will soon call a local doctor (God help you!). No sooner had I left San Luis Potosí than I read in the Spanish-language press of the alarming water condition there which even then was threatening a political revolution. It was also reported that typhoid had reached an epidemic state and that even typhus was rampant due to shortage of washing water.

"At Querétaro, I called in a doctor. He advised *agua destilada* which I arranged for at the local *farmacia*, where a kindly, plump man who, now that I think of it, resembled very much General Saturnino Cedillo, assured me he would instantly give me some at 20 centavos the liter. I waited and waited and was assured again and again *á momento*, a dear little tiny bit of a minute. When *it* came, it was warm. 'Ah,' thought I, 'that is indeed wonderful; six cents a quart only and specially distilled.' It tasted something awful. 'But doctor,' I asked, 'how can it be, this horrible taste?' 'My dear friend,' he explained, 'distilled water and boiled water are the same thing in Mexico; and to aerate it, it is assuredly necessary, is it not, to cool the water which has been necessarily boiled in a filthy pot by pouring it into another filthy pot.'" (To be continued next month.)

Here are three '07 testimonies regarding the hurricane and tidal wave that visited most of New England on September 21: Howard Chase wrote from Providence, R. I., on October 1: "I do not believe from your letter that you realize the catastrophe that hit Rhode Island and its people. Your letter did not reach me until the 28th (seven days from Boston to

Providence). The fact that the main post office was flooded in the basement and five to six feet deep in the lobby on first story might account for that, let alone the complete stoppage of all transportation, communication, and so on. The official flood-tide height during the hurricane was 13 feet nine inches above mean high tide, with water completely covering automobiles, and so on, in the downtown district, and power plants and shops on the water front. The main part of Providence is still without light, power, and telephone service. My son was nearly drowned in Market Square (in the heart of the business district) which was entirely submerged, with water over his head, and is now recovering from pneumonia. His wife had a similar terrifying experience. Their home at Quanset Point, with garage and furniture, was completely demolished and disappeared in Narragansett Bay. My own damage was terrific but not a circumstance to that of some of my relatives and friends."

From Don Robbins, written from his business address, 47 Charles Street, Providence, on October 6: "Just have your letter of the fourth forwarded from Waban. . . . Sold the house there on September 23 and moved on the 24th to 58 Rumstick Road, Barrington, R. I., just after the storm. No electricity or gas at that time and all water for drinking had to be toted by hand, as the big wave had inundated the Bristol County reservoir and pretty well salted it. Have electricity now and gas expected by the eighth. But with negligible damage to persons or property we feel most fortunate, especially in comparison with the terrific loss of life and property along the coast line of the state."

On October 7, Chester Vose wrote from Marion, Mass.: "I thank you for your kind letter of October 4 and am glad to report that we are all as safe and sound as can be expected at our age. The hurricane alone did very little damage, but the tidal wave ruined everything in its path. Personally I lost a few shingles from my screen house — which means the building where we sort and grade our cranberries — and a few trees in the woods, some of which fell on a cottage I have — maybe \$25 damage. You see I live back in the country and got no water damage. The loss on the water front is tremendous but no loss of life in Marion." Chet's daughter Carol was married on June 15, 1934, to E. Fiske Mabbett of Plymouth, Mass. They have no children.

According to an item in the New York Times of July 27, Harold P. Farrington was elected president of the Commonwealth Gas Corporation on the preceding day. The corporation, through subsidiaries, is engaged in the production, transportation, and sale of natural gas and oil, principally in West Virginia, Ohio, Texas, and Tennessee. Bottled gas is distributed in several districts in New York and Pennsylvania. The more important subsidiaries include the Memphis Natural Gas Company, West Virginia Gas Corporation, Ohio Valley Gas Corporation, Jane Oil Company, Carbons

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Consolidated, Inc., Texas Gas Utilities Company, and Atlantic States Gas Company.

Through Parker Dodge we have learned that Cecil F. Baker became connected with the construction division of the Quartermaster Corps (Army) during the early part of 1938 and is helping on a \$5,000,000 construction program at Chautauque Field. His address is 424 Champaign Avenue, Rantoul, Ill. — From Charles E. Locke '96 we learned that John Kinnear, manager for the Nevada Consolidated Copper Corporation at McGill, Nev., sailed with his family during the summer for a vacation in England, Scotland, and France. — Carl J. Trauerman has sold his interest in the Montana Stock and Bond Company, time-honored brokerage house of Butte, Mont., to Ernest Dorais, his associate. Dorais, who has been in the brokerage business for over 20 years, is now sole owner of the firm which is the oldest brokerage house in Montana. During the past few years, Trauerman and Dorais have become heavily interested in a number of successful gold mines in Montana. Carl, who is a mining engineer, President of the Mining Association of Montana, and President of a number of mining companies, will devote his time to his mining and other interests with headquarters at the Montana Stock and Bond Company, 25 East Broadway, Butte.

Kirk W. Dyer, X, whose home address is Cromwell, Conn., is connected with Bridgeport Motor Company, Bridgeport, Conn., gas engine manufacturers. — According to the city directory of St. Paul, Minn., DeWitt C. Ruff, II, is treasurer of Healy-Ruff Company, heating specialty manufacturers, at 765 Hampden Street, in that city, and lives at 2211 St. Clair Street, in the same place. — The Secretary had a fine telephone conversation on August 23 with Donald E. Russ at his home, 1 Clarina Street, Wakefield, Mass. From 1907 until 1916 Donald was with the Eastman Kodak Company, then for two years was a draftsman at the Boston Navy Yard, working under S. J. Egan of our Class, and since 1918 has practically run the retail coal business of L. E. Bennett in Wakefield. He has two daughters, Mrs. Marion Moberger and Mrs. Dorothy Maxwell, each of whom has a son.

The Detroit, Mich., directory indicates that Edwin B. Snow, Jr., II, is in the insurance business at 744 Free Press Building. He and his wife live at 7600 Kipling Avenue, also in Detroit. — To Parker Dodge we are again indebted for information, this time that Carroll S. Dean, VI, has some sort of an engineering job in the purchasing department of the quartermaster general's office and lives at 4538 Reno Road, Northwest, in Washington, D. C. — S. Gilbert Emilio, III, is curator of the Peabody Museum in Salem, Mass., and lives at 7 Winter Street in that city. — John F. Johnston, Jr., I, has as his mailing address Box 812, Santa Paula, Calif. The directory of that city gives his address as 31½ Palm Court and his occupation as personnel officer at

the United States Department of Agriculture. — The only information divulged by the Alameda, Calif., directory regarding Laurence Wetmore, II, is that he is a mechanical engineer and lives at 1732 Broadway.

A most welcome letter, dated August 31, was received from Edbert C. Wilson, I, from 47 Redington Street, Waterville, Maine. He writes: "The partnership, Green and Wilson (engineers since 1907), due to the aid the New Deal gave to business in general and to the construction industry in particular, was forced to reorganize and become Green and Wilson, Inc. I went with the National Park Service for a couple of years but now am back in Waterville with the corporation, in general contracting work. I also make engineering studies and reports in my own name, as a registered professional engineer. Both of my daughters are married. The older one, Hildagarde W. Lomas, lives in Newport, R. I. She has two sons and one daughter. The other, Eleanor W. Gustafson, lives here in Waterville and has one son." — BRYANT NICHOLS, *Secretary*, 126 Charles Street, Auburndale, Mass. HAROLD S. WATSON, *Assistant Secretary*, Commonwealth Shoe and Leather Company, Whitman, Mass.

1908

This is the first chance I have had in The Review to tell all you classmates about our 30th reunion at the Oyster Harbors Club at Osterville on Cape Cod. To those of you who have been able to attend our past reunions, it is unnecessary for me to tell you of the good time we all had, the pleasure of seeing and talking with classmates after years of separation, the outdoor sports and the comradeship of the whole outing.

The fellows began to arrive during the afternoon of Friday, the third, and by dinnertime 29 had shown up. The evening passed quickly with the fellows talking over the old times and learning from each other what had happened in the past 30 years. George Glover, reunion chairman, had quite a bunch of interesting letters from classmates, scattered all over the world, who were not able to attend. These were passed around among the crowd, and we enjoyed hearing about some of the fellows we had not thought of since graduation. Of course card games were started, and we were initiated into the proper bidding for contract. At other tables we watched the piles of chips grow and decrease, as Dame Fortune smiled this way and that.

Saturday we were up in good season but unfortunately the weather man was not at his best for us. However, the golfers were out in force, and numerous non-players followed them around to cheer and advise. Others motored around the Cape, enjoying the ocean scenery, while others just sat and talked. By noon it had started to rain, and we were all glad to come in for our luncheon. After luncheon, although it was still raining, about two boatloads of hardy mariners were ready to take their chances with fishing. Hap Ellis had his cabin cruiser brought

around to the club and took part of the fishermen down the bay, while another boat from Crosby's took the balance who wanted to troll for sea bass. The latter boat was "high line," and Harry Lord saved the day for the entire Class by landing a striped sea bass. The fellows who did not go fishing spent the time playing cards, talking, and so on, although a few hardy individuals did a little tramping.

During the day more fellows had arrived, so that by evening there were 39 of us. From six to eight o'clock, Room No. 28 and the porch were popular places. Everyone seemed just to drift in and stay. Stories and sweet music filled the air. At eight o'clock, after the other guests of the club had had their dinner, we sat down to our banquet, which ran till ten o'clock. Songs, cheers, and speeches were interspersed with the eating, but nothing in the serious vein. Hap Ellis, who is, incidentally, a director of the Oyster Harbors Club, apparently used his influence on the chef, as the banquet was a most excellent one. Hap had also arranged for a special piano in the dining room and he, ably seconded by Dick Collins, led in singing familiar old Tech songs. After dinner, the card sharks were at it again, while the grill-room emitted sounds of laughter and sweet music till the wee hours of the morning. Our dining room piano followed us down to the grillroom, and Hap and Dick Collins kept the keyboard warm, seconded by an impromptu quartet which did noble work, especially the whisky tenor. The quartet attacked grand opera just as fearlessly as they rendered the more popular melodies.

Sunday was warm and clear. The golfers were at it again; others motored around the Cape; and others sat and swapped stories in the sun. After our Sunday dinner we broke up, most of us heading for Boston for the All-Technology Reunion on Monday. Of course the weather could have been better on Saturday, but everyone had a bully good time, and we are all looking forward to our 35th reunion five years hence.

One long-distance member was Desaix B. Myers, who came from Los Angeles, his first time in Boston since he was graduated. George Glover, who had charge of the reunion, was assisted in Boston by Nick Carter, Alton Cook, Myron Davis, Toots Ellis, and Linc Mayo.

Those present at the reunion were: Desaix B. Myers, 686 LaLoma Road, Pasadena, Calif.; Harry C. Lord, 49 Daniels Street, Lowell, Mass.; Paul A. Esten, 195 Walnut Street, Stoughton, Mass.; R. E. Drake, 69 Fairview Avenue, Brockton, Mass.; Harold P. Gurney, 75 Longwood Avenue, Brookline, Mass.; George T. Glover, 1333 Lakewood Avenue, Lima, Ohio; Stephen C. Lyon, 44 Elton Street, Providence, R. I.; B. S. Leslie, 26 Thorndike Street, Beverly, Mass.; Richard C. Collins, 228 Lincoln Street, Newton Highlands, Mass.; H. L. Carter, 14 Roslyn Road, Waban, Mass.; C. Fred Joy, Jr., 50 Meredith Circle,

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Milton, Mass.; Charles A. Edmonds, Garrett Park, Md.; Burton W. Cary, 6 Everett Avenue, Winchester, Mass.; Howard Luther, 2570 Grandin Road, Cincinnati, Ohio; Langdon Coffin, 150 Church Street, Newton, Mass.; W. E. Booth, 11 Bentwood Street, Foxboro, Mass.; H. W. French, 536 Seminole Drive, Erie, Pa.; G. M. Belcher, 225 Waban Avenue, Waban, Mass.; J. M. Burch, Jr., 1105 Grove Terrace, Dubuque, Iowa; Myron M. Davis, 97 Bogle Street, Wellesley, Mass.; George E. Freethy, 98 Barnard Avenue, Watertown, Mass.; Charles W. Morrison, 51 Fifth Avenue, New York, N. Y.; Harold E. Weeks, 20 Willow Street, Brooklyn, N. Y.; Charles M. Steese, 110 Larchwood Drive, Cambridge, Mass.; Lincoln Mayo, 1869 Beacon Street, Brookline, Mass.; A. M. Cook, 38 Wachusett Road, Chestnut Hill, Mass.; H. R. Sewell, Lincoln Street, Norwell, Mass.; A. H. Thompson, Squirrel Road, Wellesley Hills, Mass.; W. B. Hunter, 16 Elm Street, Wellesley Hills, Mass.; Karl R. Kennison, 28 Byfield Road, Waban, Mass.; Joseph Pope, 16 Hamilton Avenue, Bronxville, N. Y.; H. W. Griswold, 95 Huntington Street, Hartford, Conn.; Leslie B. Ellis, 318 Vinton Street, Melrose, Mass.; Alexander Ellis, 184 Clifton Street, Belmont, Mass.; Franklin T. Towle, 137 Mount Vernon Street, West Roxbury, Mass.; Joseph Warren Wattles, 3d, 208 Chapman Street, Canton, Mass.; Stiles F. Kedy, 1200 Franklin Street, Melrose, Mass.; Herbert T. Gerrish, 194 Warwick Road, Melrose, Mass.; and H. W. Blackburn, 240 Roosevelt Avenue, Syracuse, N. Y.

The Class was well represented at the Alumni Day luncheon on Monday, June 6. The following were present: Cookie and his wife, George Freethy and his wife and daughter, George Belcher, Charlie Steese, Burt Cary, Karl Kennison, Myers, Harry Lord, Joe Wattles, Toot Ellis, Doc Leslie, Hunter, Jimmie Burch, George Glover, Ted Joy, Nick Carter, Linc Mayo, Howard Luther, Sewell, Towle, Porosky, and Damon.

At the Alumni Day banquet on Monday evening we are glad to report the biggest turnout that our Class has ever had, as the following showed up: Doc Leslie, Charlie Steese, Porosky, Towle, Carter, Mayo, Hunter, Freethy, Coffin, Belcher, Toot Ellis, Joy, Cookie, Wattles, Burch, Harry Lord, Damon, and Luther.

We regret to report, in conclusion, the deaths of two classmates, Eber Wells on May 15 and Roger F. Scannell, Jr., on August 19. — H. LESTON CARTER, *Secretary*, 60 Batterymarch Street, Boston, Mass.

1909

Thirtieth reunion is to be at Oyster Harbors Club, June 3 to 5, 1939. — Chet Dawes was one of the coauthors of the winning paper on theory and research for a prize offered by the American Institute of Electrical Engineers, the subject being "A Study of Electrical Characteristics of Suspension Insulators." Chet was recently elected vice-president of the American Institute of Electrical Engineers and is in charge

of the Northeastern section of the society (comprising New England and Upper New York State). — John Willard is now dividing his time between his Boston and New York offices and has moved his family back to their former residence in Waban. Recently John told me about the thrilling experiences of his eldest daughter, Virginia (Mrs. Nathan W. Wentworth), whose husband is in the Paris office of the American Foreign Insurance Company, an organization similar to the Factory Mutual here.

John has very kindly sent to me some excerpts from one of Virginia's recent letters, which give a graphic picture of events in France: "Now that all the excitement has died down, I'll try to collect my wits again for a letter. Last week at this time the situation was the tensest I ever hope to see it. Nearly every French family I knew of, from the butcher right up through the most socially prominent, had at least one male member at the front and others just called. Women and children were leaving the city by the thousands, and no one believed a war could be averted. Nearly every block one would see a big sign on a building showing where a bombproof shelter might be found. All apartment buildings had official bulletins posted, giving information about signals, gas masks, and so on, and at night the streets were almost without light. Every sixth lamp was lit but by a very dim and especially shaded bulb. Headlights were allowed to be on at only the dimmest possible degree. The streets were full of soldiers and boys with suitcases, leaving to be mobilized. At all the steamship offices Americans were practically selling their souls for a place on an already overcrowded steamer. . . . The Grams, who were here last week, had to postpone their departure two days, as they were sailing on the S.S. *Hamburg*, and no German boats left Germany for several days, until the tension died down."

John's second daughter, Elizabeth (Mrs. Frank L. Cusumano), had a daughter born last March, so John is now eligible for the Grandfather Club. John's son-in-law is with the Philip Morris Company. Marion, the youngest daughter, who was graduated from Wellesley in 1936, is in the Wellesley College Alumnae Office.

Hazel Gram and the two girls have just returned to the States (October), having had a most interesting automobile trip this summer on the Continent. In Dresden, Hazel picked up Alberta, who has been studying voice in Germany for about a year and a half, and then went on to Switzerland to get Gloria who has been at school at Lugano. She and the two girls continued through Italy, Hungary, Holland, Belgium, and France. They were in Germany during the conferences between Hitler and Chamberlain, being right in the midst of those stirring events.

At the fall meeting of the Textile Operating Executives of Georgia, held in Atlanta last October, Allen Jones, superintendent of the Muscogee Manu-

facturing Company, Columbus, Ga., was elected general chairman for the ensuing year. Since graduation Allen has been associated with the cotton textile industry and has spent most of his time in the South. — CHARLES R. MAIN, *Secretary*, 201 Devonshire Street, Boston, Mass. *Assistant Secretaries*: PAUL M. WISWALL, MAURICE R. SCHARFF, New York; GEORGE E. WALLIS, Chicago.

1911

Well, sir, little did I realize on the morning of September 21, when I mailed in my notes for last month's Review and said "the current rain augurs well for the coming week-end, when your Secretary will once again accept the invitation of the Technology Christian Association for the annual sub-Freshman week-end camp," that before nightfall we would have a tropical hurricane that would make Camp Massapoag up at Dunstable unusable for the camp. [Mr. Denison didn't realize that the Editors reconstructed his opening paragraph on account of the storm, so the foregoing never reached print.] The program was conducted, the locale being right at M.I.T., with the dormitories housing the incoming freshmen.

One of the active leaders for the affair was young Oz Stewart, a Course II senior. He is chairman of the budget committee of the Institute Committee this year. I also saw young Jack Herlihy, a Course XV senior and last year's track manager. Later I met big Jack Herlihy's brother, Frank '15, who was at the freshman smoker that Monday evening with his son, a member of the entering Class of 1942. During the week-end I had several chats with Warren Loud, Roger and Esther Loud's oldest boy, who is also a freshman this year. He is a most ambitious youngster, scientifically inclined, and is planning to take Course XVIII, mathematics.

It is indeed a sad duty to report the death on October 9 of a classmate — Charles Henry Harrington, I — in New York City. Always known to us as Skip, he was the soul of wit both in undergraduate days and in later years. For several years he had been quite ill; even when he and his wife came to our 20-year reunion up at Douglas Hill, Maine, his health was not of the best. He served overseas with the 301st Engineers during the War and afterward with the American Army of Occupation in Germany. Upon his return to this country he became associated with the construction engineering firm of Patrick McGovern, Inc., in New York City and worked on many subway and tunnel projects in New York, Boston, and Philadelphia. He was a native of Cambridge and after graduation he worked, prior to enlisting, as public works engineer for the city of Boston. Surviving are his widow and six children, residing at 33-15 161st Street, Flushing, N. Y.; his mother, Mrs. Winifred Harrington Casey of Boston; and a sister, Mrs. E. Russell Murphy of Boston. The sympathy of our Class has already been extended to his family.

1911 Continued

Fred Daniels, VI, President of Riley Stoker Corporation here in Worcester and for several years a life member of the trustees of Worcester Polytechnic Institute, was elected a member of the executive committee at its annual fall meeting the latter part of October. This is a well-deserved honor to a very public-spirited citizen. — I learned that Ed Woodward, VI, was a visitor at the Institute this fall, and I'm indeed sorry he was not able to stop off at Worcester to say "Hello!" Ed is Western mechanical editor of *Railway Age* and makes headquarters at 105 West Adams Street, Chicago — the city where the first two games of this year's baseball classic (?) were played. Word also comes from Professor Locke '96 that Donald Barton, XII, research geologist and geophysicist of the Humble Oil and Refining Company, recently returned to Houston, Texas, after attending local meetings of the American Association of Petroleum Geologists — of which he is president — in Michigan, Illinois, Kansas, and Colorado. From the Register of Former Students comes an advice that Ewazo Suzuki, X, still associated with the Taiyo (Sun) Soda Company, Ltd., is now located at Tarumi, Hyogo-ken, Japan, instead of at Kobe as formerly.

A class dinner was to be held in the Silver Room at Walker Memorial, Cambridge, on the evening of the seventh day of the 11th month, which should provide some human interest for next month's notes. Remember that *you* have a responsibility to "Write to Dennie" occasionally, and I do mean *you!* — ORVILLE B. DENISON, *Secretary*, Chamber of Commerce, Worcester, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford, Mass.

1912

It is with deep sorrow that we announce the death of Vincent W. Allen, II, assistant works manager of the Bridgeport Brass Company, who died Thursday morning, August 25, at the Waterbury Hospital in Waterbury, Conn. He was 49 years old. Mr. Allen, who had been connected with the brass industry for 28 years, was born on October 6, 1888, in New Milford, Conn., the son of the late William M. and Caroline Weaver Allen. He was graduated from the Torrington High School, Andover Academy, and from the M.I.T. as a mechanical engineer. After his graduation, he was first connected with the American Brass Company in Torrington, Conn., as master mechanic. In 1923 he was transferred by the American Brass Company to the Toronto Mill at New Toronto, Canada, as chief engineer.

On July 1, 1927, he went to Detroit as works manager of the Michigan Copper and Brass, Inc. This company later merged with the Revere Copper and Brass Company, who sent Mr. Allen to Rome, N. Y., in 1930, as general manufacturing manager of all of their mills, from which position he resigned in 1932. Shortly thereafter he took up his position with the Bridgeport Brass Company. Mr. Allen, who was one of three executives

of the Bridgeport Brass Company to make a tour of Europe in 1936 for the purpose of studying design and methods of production used in copper and brass mills of England and on the Continent, was, because of his experience in the leading mills of the United States and from former tours of Europe, one of the best informed engineers in the nonferrous industry. He is survived by his wife, Disa Brackett Allen, two daughters, Ann Joann and Joy, and by three brothers, James W. of Stamford, George H. of New Milford, and Wilbur H. of Waterbury.

The New York *Times* recently carried a sketch of the Colonial-style public school to be erected in Queens, at an expense of \$650,000, from the drawings of Eric Kebbon, architect. Mayor La Guardia commented as follows in a letter to the Board of Education: "I have your letter inclosing photograph of a rendering of the proposed Public School 31 in Queens. It is a beauty! This alone indicates justification for the change in the archaic, political, incompetent Building Bureau of the Department of Education. The bureau now has not only honesty and competency but a soul." — FREDERICK J. SHEPARD, JR., *Secretary*, 125 Walnut Street, Watertown, Mass. DAVID J. McGRATH, *Assistant Secretary*, McGraw-Hill Publishing Company, Inc., 330 West 42d Street, New York, N. Y.

1913

Bill Ready, our genial and able Class President, wishes to remind us that we owe much to Reunion Committeemen Hartnett, Portal, Fessenden, and Thompson. They supplied punch, ideas, and work, for all of which, many thanks, boys.

In the very short time available for talking shop at the reunion I discovered that we have some big names in business and some out-of-the-ordinary occupations. Dave Nason, XIV, in Milwaukee, devotes himself to the fanciful business of simulating expensive furs from sheepskin. What alchemy! Jack Farwell, II, is president of the Sperry Gyroscope Company, Inc. Lester Gustin, I, designs and builds moderate-sized factory and mercantile buildings. If you give Lester your space and load requirements, he'll do the rest and do it well, cheaply, and quickly. He says: "Ask the man who owns one of the buildings I have built." During the worst part of the depression Lester dug into thermoplastics and got somewhere. He has a busy factory in Lowell, with his son in charge. Alfred Loebenberg, X, is vice-president of the great Barrett Company in New York. Joe Cohen, X, the founder of Atlantic Gelatin Company, Inc., of Boston, is that company's general manager and vice-president. Miles Langley, I, is a manufacturer of canned foods in Portland, Maine. Miles interested several of us for an hour, all too short, with an explanation of some of the problems he encounters in the canning business. When I left him I had the conviction that my own business problems are trivial, no fooling.

Bill Brewster, II, now controls the destiny of the ancient, honorable, and very big Plymouth Cordage Company. Believe me, Bill is a capable man, and I am indebted to him for an insight into Larry Hart's "personality plus five" system, or whatever you call it. Bill is, above all things, lucid, but even so I am still puzzled. At any rate, here goes: Personality plus five is a comprehensive sales method which supersedes the high-pressure method. In its operation a buyer is charmed; the salesman is welcome, nay he is embraced. His difficulty is not that he may fail to get an order — he knows that he is certain to get it — but to protect his customer from the tendency to order too much. That is the salesman's only concern. I offer a prize of 25 silver dollars to the man who will teach me this system and guarantee success.

Here's a treat for you in Bill Ready's "first letter to a class secretary, a new leaf turned." I hope Dennie '11 reads it and turns green with jealousy. Bill writes: "I intended to write you from San Francisco, after seeing Al Gibson, but things got to moving too rapidly. In fact I had a rather full summer, part of which you know about. Very soon after the reunion we spent a very delightful week-end at Larry Hart's in Bronxville; first to be present on the 16th birthday of Larry's young daughter (and she is sweet sixteen), and second to present Larry with a small token of the Class's appreciation in commemoration of the very fine talk that he made to the Class of 1938. Larry seemed most grateful for the remembrance of the Class, but I assured him we were still indebted to him. Two weeks later Mrs. Ready, Bill, and I started on a gypsy trip. Bill is a junior at the Institute this year, and inasmuch as this was probably to be the last summer we would have him solely with us, we decided to make the most of it.

"Our first stop was Chicago, where I called Stan Parker and had a very pleasant conversation with him. Stan regretted exceedingly not having been able to come to the reunion. Our next stop was Rapid City, S. D., just beyond the Bad Lands, after about 300 miles of the hottest weather that I had experienced in some time. It seems that about 1870 our forefathers fought and bled and took this land away from the Indians. My, what a mistake they made! The Black Hills are interesting. Rapid City is a thriving tourist town from which there are many trails to interesting points: Mount Rushmore where Borglum is carving the four presidents, the Sioux Indian reservations, the Needles, prehistoric animal quarries, petrified forests, and above all a trail to Deadwood, the home of Wild Bill Hickock, Calamity Jane, and many others of our early frontier.

"From here we hit for Yellowstone by way of Shoshone Cavern; saw Old Faithful spurt every 63 minutes, plus or minus five, and some of the most marvelous scenery on this continent. Bears, deer, squirrels, elk, buffalo — all seem to be as tame as domestic cattle. One could spend two months in the park. . . .

1913 *Continued*

"We then struck north to Glacier Park with the Rockies on either side of us for 400 miles. No country has more beautiful scenery than is witnessed on this trail. At Glacier we went over Logan Pass above the snow line and down a road carved in the side of the mountain with almost vertical sides. Dropped in on Grand Coulee, where the Columbia River, in the far distant ages, shifted its bed and gave the government a chance to build an enormous dam. We continued west across a strip of desert which extended through the middle of the state of Washington to Seattle with its beautiful harbor and its Northern Peninsula where firs grow 20 feet in diameter; then on to Portland, which was formerly known as the City of Roses but which has lived on its reputation for the last 15 years; up the Columbia River Highway and then south by Mount Hood to Crater Lake, the elevation of which is 9,000 feet, reputed to be a great fishing spot. But I don't believe there is even a minnow in the place. I never tried harder and caught less. From there we headed to San Francisco, with its bridges and expositions. It is really a wonderful town. I had time to call Al Gibson on the last day we were there and had a very interesting talk with him. He has changed but little for 25 years. Same happy-go-lucky enthusiasm, masking a pretty level business head. He showed me a lot of pictures of his ranch and invited me to stay over, but we had to get along. I convinced him that he had made a mistake in not attending the reunion.

"Next we traveled south through the big trees to Santa Monica, famous for Marion Davies' beach house with its 60 guest rooms. Thence to Los Angeles, where we heard Bob Burns broadcast and saw Paramount make pictures. We took in a *premiere* and saw the gang fight for autographs. Went to the Brown Derby, the Trocadero, and the polo games just like the rest of the Eastern farmer boys. Los Angeles is a wonderful city, but we in the East must travel to appreciate New England. There are many fine people in Los Angeles, but there are also some who still need polishing, and the town gives one an impression of a large exposition slightly shopworn. I still like Cape Cod.

"The desert was interesting but almost broke us buying dry ice to keep the car cool. Boulder Dam is about the finest piece of engineering that I have ever seen and someday, I believe, will be a big asset to the country. From there, with the thermometer at about 120 degrees, we traveled to the Grand Canyon, where a sleet storm had dropped the temperature to 60 degrees. Standing out at Inspiration Point we could see for 60 miles in any direction. There were three storms visible in the canyon itself, with the usual display of lightning, and five storms on the plateau from 10 to 20 miles beyond the South Rim. The view was really inspiring. Bryce Canyon, a marvelous picture of pink and white minarets a thousand feet high. . . . Then the salt flats where our English friends are fighting for a speed record, and the great Salt Lake itself.

"The next day found us in Evanston, Wyo., at a rodeo in its native heath, with some of the performers who were here at the Boston Garden. The crowd, however, was much more interesting and the atmosphere entirely different. Our next stop was for a wedding in Chicago and then home where we have had one delightful tropical storm as a celebration of our home-coming; but then you know about that. The summer is complete, and it's back to work, but I never spent a more interesting summer, starting with the reunion and finishing with this storm."—FREDERICK D. MURDOCK, *Secretary*, Murdock Webbing Company, Box 784, Pawtucket, R. I.

1914

While no formal committees have as yet been appointed, some preliminary investigation has already been made as to the possibility of holding our 25th reunion in or near Cambridge, as has become the custom of other 25-year classes, and to have certain of the events family affairs. Although '14 has been strong for making these five-year events stag and at some shore resort, there has developed considerable sentiment in favor of an exception for this particular quarter-century meeting. The *Fourteen Pointer* will soon make its appearance with the latest news on reunion plans; so start making yours to be with the gang the first week-end in June.

A pleasant custom at Technology now is a smoker held on the evening of registration day for new students and their fathers. The event is run by a committee of seniors, and prominent on this year's committee was Leigh S. Hall, Jr. Your Secretary, who, on behalf of the Alumni, presented the key to Walker Memorial to the new senior-class president, sat beside young Hall during the dinner and learned with much interest that he was filling several positions formerly held by his father. Three weeks later at the invitation of Malc Mackenzie, who is secretary of the Technology Club of New Hampshire, your Secretary went to Manchester to attend their annual meeting and there had a chance to see Leigh Hall, Sr., who had come down from Concord. At the student meeting Walter C. Eberhard was present with his son, Walter S., who is a member of this year's freshman class.

Donald Dixon turns Sunday-school teacher! He would not admit to your Secretary whether it was to atone for his own sins or to balance the lives of other '14 men. But in any event there he is every Sunday at Bourne, Mass., doing his bit.

While detouring via Worcester by train to New York, because of the closing of the usual route by the hurricane, your Secretary had the pleasure of having A. W. Johnson get on at Worcester, where he has been located for several years as purchasing agent for the State Mutual Life Assurance Company. On another trip, while waiting to board the Boston train at Buffalo, he met L. F. Marsh, also returning home. Marsh, who is with the Reed-Prentice Corporation of Worcester, Mass., was just returning from a

midwestern business trip.—H. B. RICHMOND, *Secretary*, General Radio Company, 30 State Street, Cambridge, Mass. CHARLES P. FISKE, *Assistant Secretary*, 1775 Broadway, New York, N. Y.

1916

There is little news of classmates at this time. However, your Secretary will continue to seek information of interest. Apparently all classmates have lost their self-starting pens and are neglecting to contact your Class Secretary.—Ed Williams, II, is vice-president of the Cotton and Woolen Manufacturers Mutual Insurance Company of New England. I thought we would have some interesting news from him or Hovey Freeman concerning the New England hurricane, but nothing has developed as yet.—I run across Steve Brophy's trail every now and then out at Battle Creek, Mich. He is now president of the advertising firm of Kenyon and Eckhardt, Inc. He tells of meeting Bob Wilson early in October at The Homestead, Hot Springs, Va., where apparently both Steve and Bob were polishing up their bridge and golf.—Ed Barry, general sales manager of the Riley Stoker Corporation, dropped into my office recently. I learned that he has two boys, one 11 years old and the other 16. The 11-year-old youngster is a football player on the Bancroft School team. The other boy attends Worcester Academy.—JAMES A. BURBANK, *Secretary*, The Travelers Insurance Company, Hartford, Conn. STEVEN R. BERKE, *Associate Secretary*, Coleman Brothers Corporation, 245 State Street, Boston, Mass.

1917

Your Assistant Secretary in attempting to carry out his first assignment for this season finds himself almost completely lacking in material for inclusion in these notes. He hopes the dearth is seasonal and that some of you will cast false modesty aside to the extent of letting your Secretaries know what is happening to you and why!

Ken Lane was reported to have made a long and interesting flight to South America and way stations last spring. To date, our request for a personal account of this trip has not brought results, though we are still hopeful. And while we are on this question of our expectant state of mind, how about that long-overdue letter from Al Moody?—Jimmy Doon was elected vice-commander of the New Hampshire State Department of the American Legion at its spring meeting in Portsmouth. He has recently served on Governor Murphy's emergency committee for flood and hurricane relief as representative of the state public service department and of the Legion.

Ted Bernard's son, David, is an upper middler at Exeter, and it is very pleasant for me to be able to catch a few minutes now and then with Ted when he comes up here. David, incidentally, is doing well and reports that he is bound for the Institute. In this connection it would be interesting if the Dean of Students would inform us of other 1917 sons enrolled

1917 Continued

at the Institute. Your Assistant Secretary seems to have produced a Princetonian, and Jim Anderson's son is now a sophomore at Harvard. Of others I have no information. [Two olive branches: William H. '42, son of William L. Dennen; Gordon R. '42, son of Harold C. Newmann. — EDITOR.]

It seems absurd for the writer of these notes to have to fill up a decent length column by recounting his own activities. Absurd though it may be and as a horrible example of the consequences of the failure of so many of you to write us an occasional note, the Assistant Secretary would report that he put in a long summer in Exeter sitting on the lid of the summer session and that he has since been somewhat involved in the matter of rebuilding and cleaning up a recently acquired old farm of modest size near the village of Meriden, N.H. Come spring, if I hold out — and some of Penn Brooks's gadgets will work as claimed — I hope that 1917 travelers on the road from Lebanon to Claremont will turn in at the gate. We'll probably be laying a brick or a floor or — more likely — just laying. There isn't a latch string, and the doors blew in with the hurricane! — RAYMOND STEVENS, *Secretary*, 30 Charles River Road, Cambridge, Mass. PHILIP E. HULBURD, *Assistant Secretary*, Phillips Exeter Academy, Exeter, N.H.

1918

"It's an ill wind," you know, "that blows nobody good," and I have the far from purifying effects of the recent hurricane to thank for being allowed once more the joy of presiding over these columns. "I haven't known a minute's peace," writes Gretchen, asking our assistance, "for over a month now. Four weeks ago tomorrow was the hurricane and tidal wave, and it hit us at school to the tune of about \$10,000. And you should see pictures and read the story of what has happened to dear old Weekapaug. Nothing is left of it but the north, or rear, wing, and every cottage up the beach is gone. A new break has been made from the ocean to the pond just west of the inn. I am going down and have a firsthand view myself next Sunday and am taking pictures myself.

"The storm has upset the second try in getting the pictures out, but I have had a letter from Burdick now that he is getting them right out. I saw Pete Sanger and his family on Sunday. They had 18 inches of water over their whole first floor, and the family car found itself submerged by five feet of water in the garage. The experiences that have come to those of us along the coast are almost unbelievable. You should have seen Thomas School on Thursday A.M., September 22. One room of our boathouse which was a classroom was just washed out; three sides of our dining room which is mostly glass were smashed in and then took the whole waterside of the building out. . . .

"There is a lunch in New York of the '18 crowd tomorrow, but I cannot get in this time. Sometime later in the season I will get there. . . ."

Life for September 26 published a picture of our Royal Barry Wills which exaggerated his noble dome but not the usual twinkle in his eye. Bracketed with architect Frank Lloyd Wright of international repute, Bill's write-up is enough to convince even this moldy old skeptic. It says: "Architects for the Blackbourns: Wills and Wright. Royal Barry Wills . . . was commissioned [by *Life*] to design a 'traditional' house for the Blackbourns of Minneapolis . . . partly because he is a Bostonian and knows what cold winters are like, partly because he is a businesslike type of architect whose work makes an interesting contrast with that of No. 1 artist-architect, Frank Lloyd Wright. Graduate of M.I.T., Mr. Wills is the best-known New Englander in the residential field." That ought to leave somebody in a peachblossom mood, that sweet little lady who is Mrs. Royal Barry, for example.

"Irving G. Hall, Jr., well-known Boston marine insurance and shipping man," says the *Standard Insurance Weekly*, "is a leading candidate for the position of director of Massachusetts' new 'waterways division,' a \$6,000 post to be filled by the commissioner of public works, with the approval of the governor. There are now less than 40 candidates for the office, it is said, and there is every appearance that legislators are trying to force the appointment into the political arena.

"Described as a long range port plan to modernize and rebuild Boston's waterfront through the use of state credit, the waterways division will consider the specialized fields of traffic, pier construction and operation and import and export matters. A graduate of Massachusetts Institute of Technology and in the marine business for 19 years, Mr. Hall's associates consider him an ideal man for the new post."

To this a Boston paper adds: ". . . He has substantial backing with practically all the port organizations and waterfront workers favoring him as the Governor's choice. Mr. Hall is a native of Somerville, born March 2, 1896, of an old seafaring family active at this port for more than a century. His grandfather entered the firm of Ladd & Hall, ship brokerage and commission merchants in the year 1830, and 17 years later the firm of John G. Hall & Co. was established, owning and operating full-rigged ships in practically all world trade routes. The business has been continued by young Mr. Hall, who has had experience in all phases of the steamship industry and allied lines, including importing, exporting, chartering and marine insurance. He studied engineering at Tech, and saw two years of active service in France during the World War, starting as a private and returning with the rank of first lieutenant."

The Fidelity Machine Company of Philadelphia has appointed Sidney B. Blaisdell as New England sales representative, with offices at 228 Aborn Street, Providence, R.I. Sid has been located at the main plant in Philadelphia for the

last 12 years and as New England representative is prepared to serve manufacturers in the knitting, braiding, clothing, and special textile machine field. Too bad his return to New England was spoiled by the hurricane, which, as you doubtless know, produced a tidal wave that piled the water up 12 feet deep in the main square of Providence. We get faint just thinking about it.

We record with regret the deaths of Henry Stephens' mother and of Mrs. Donald Merrill. Don and the two children are facing the future fearlessly. We made a trip to Hartford to see him, and as a sort of extra dividend dropped in on Harold Fitch who has deserted Albany recently. Harold hasn't changed one bit since he was a captain in Tech's Iron Battalion.

As for ourselves, we spent the summer building an honest-to-goodness log cabin with our two sons. Don't try it. The work is herculean, even if the results are rewarding. The best part of the experience had to do with the acquisition of that sort of spiritual private property which comes from an intimate sharing of difficult experiences. I was knife-edged atop the ridgepole, a bestriding colossus resplendent in nothing but shoes and shorts and breathing rancid words at a rafter that just would not fit into place. "Don't look now," said my youngest, appraising the situation from below and determined to relieve the pressure. "Don't look now, Dad, but I think you have a run in your stocking!"

We finished the cabin at noon on September 21, finished it and rejoiced in the prospect of being able to relax and enjoy it the next time we returned. For two years we had worked consistently and with a fervor that often produced a backache ankle deep. That night the wind laid its incongenial hand upon our five acres. In the presence of disaster one is shaken by a few hours of shock and then goes valiantly to work again. Arbor Day ought to mean something in 1939. When we shall spend a week-end at "Happy Valley" that is entirely relaxation and no hard work, only the gods can tell.

Meanwhile we have been pardonably preoccupied with much that has interfered with the publication of "The Eighteenth Amendment." It is not sheer contentiousness on our part which delays the appearance of that important document. Truly it is receiving all the attention one can legitimately steal from other things. So look in the toe of your Christmas stocking. Maybe you'll find your copy there. — F. ALEXANDER MAGOUN (kicked upstairs to be class president) for: GRETCHEN A. PALMER, *Secretary*, The Thomas School, The Wilson Road, Rowayton, Conn.

1919

On a recent trip to Detroit and Flint, Mich., your Secretary dropped in on Charles Chayne, chief engineer of the Buick Motor Company, and after a cordial reception inspected the new Buick models, at that time unannounced, and

1919 Continued

also made an interesting tour of inspection of parts of the factory. Charlie appears the same as in the old days at the Institute. One would never guess from the broad smile the responsibilities which he is carrying. I noted with interest while waiting in his office that on the organization chart he reports directly to the president.

We are indebted to Gretchen A. Palmer, Secretary of the Class of 1918, for the information that Mrs. Walter O. Wood (formerly Margaret Alice Curry) is "alive and kicking," living in Tiverton, R.I. She was married around 1920 and has two sons, aged 12 and 10.

On a trip to New York City, I called on the Lummus Company and ran into Gene Smoley unexpectedly. Gene has a swell job on the sales engineering end with this outfit who are internationally known as one of the leaders in the manufacture of chemical and oil refining equipment. Later I had the pleasure of meeting Mrs. Smoley and having dinner at their home in Hastings-on-Hudson. Gene has certainly gone places in the refining industry and is, as always, much interested in class affairs. I worked hard on him to become associate secretary covering the New York area, now that he has returned from his travels in Sumatra and other foreign countries.

I have already mentioned in these notes, in a previous issue of *The Review*, my severance of relations with the Brown Instrument Company to form my own company dealing in pyrometer supplies. This work is making satisfactory progress to the point, unfortunately however, where it requires so much of my time traveling around the country that I have been forced to give up all outside activities. It was therefore with great regret that I found it necessary to advise Professor Locke '96, Alumni Secretary, of my inability to continue any longer as temporary secretary of the Class. None of my outside activities afforded me any greater pleasure than the renewal of old friendships at the Institute. With the added interest shown in class affairs during the last two years, it is quite evident to me that we are far from "dead" and are taking the place in Institute affairs that rightfully belongs to a Class of our prominence. Considering the caliber of the class notes for the last two years, my resignation is definitely a marked step forward, but it was nevertheless loads of fun. I am looking forward to attending the next Boston class get-together, now being arranged by our local entertainment committee, and also to seeing all of you other fellows around the country at our 20th class reunion in Boston this June. — ARKLEY S. RICHARDS, *Secretary*, 26 Parker Street, Newton Centre, Mass.

1921

With the newspapers full of Dr. Wiener's calculus of chaos, we see at last a ray of hope for determining in advance the quantity of news notes, if any, which will arrive from members of the Class before our editorial dead line on the 25th of each month. Bet it can't really indicate

how many answers we'll get to post cards — a calculation which defies the theory of chance and probability!

Johnny Mattson's picture adorned news items in the Boston papers announcing his appointment to serve the country famous throughout these United States for its recognition of war debts. Said the *Boston Traveler*: "Attorney John B. Mattson of Winthrop has been appointed Vice Consul of Finland to serve the New England district. His office is at 1 Federal Street, Boston. Mattson, who was born in Rockport, has been active in Finnish affairs all his life. In addition he has had business experience, has taught electrical engineering and has patented several inventions. An ardent lover of music, he has both conducted and played in bands and has led several choruses. He prepared at Fitchburg High School and was graduated from M.I.T. in electrical engineering in 1921. Four years later he received his LL.B. from Northeastern University and entered the law office of the late Andrew J. Peters in 1924. He is now associated with the Boston law firm of Peters, Clark and Keating. He is married and has four children."

Harold M. Estabrook, II, is also very much in the news, according to items appearing in several Boston and New York journals. From the *New York Journal of Commerce*: "Harold M. Estabrook has been appointed state agent for the eastern Massachusetts and Rhode Island territory of the Firemen's Association of Philadelphia, one of the oldest fire insurance concerns in the country. A native of Massachusetts, Mr. Estabrook was graduated from M.I.T. in mechanical engineering and has since engaged in various phases of the fire insurance business, having joined the Fire Association in 1937. He makes his home in Arlington, where he is a Selectman."

Herbert W. Reinhard crashed the front page with the following from the *Paper Trade Journal*: "Herb Reinhard, Chicago manager of the Brown Company, Towel Division, has resigned to join the Schwarz Paper Company, 1430 South Canal St., Chicago. Mr. Reinhard was with the Brown Company for five years and has supervised and managed the Towel Sales Division out of the Chicago office, covering 20 states. He will have charge of the towel department in his new association. Mr. Reinhard was graduated from M.I.T. in engineering administration. He is married and makes his home in Evanston." Ever see Jimmie Janes, Herb?

Saint reports running into Albert J. Hanley, X, who since 1929 has been with Respro, Inc., of Providence, R.I., and who is now chief chemist of that concern. Red is married and has two youngsters, a boy and a girl. — Mail addressed to the following at the addresses given has been returned by the post office to the office of the Register of Former Students. Will anyone knowing the correct addresses of these members of the Class kindly notify Cambridge as soon as possible: Harry J. Abrams, XV, Hobart, N.Y.; Elmer W. Davis, II, 143 Allen Place, Hartford, Conn.?

Current addresses have just arrived for the following: Carl M. Cohen, X, 185 Madison Avenue, New York, N.Y.; John S. Ferguson, X, General Electric Company, Laboratory Building 4, Schenectady, N.Y.; Commander Paul W. Fletcher, II, Naval Torpedo Station, Newport, R.I.; Henry P. Harris, I, St. Louis Road, Collinsville, Ill.; Henry A. Hutchins, XIII-A, Western Advertising Agency, Room 2720, 35 East Wacker Drive, Chicago, Ill.; Commander Henry R. Oster, XIII-A, Bureau of Aeronautics, Navy Department, Washington, D.C.

Other recent address changes include: Walter J. Hamburger, II, 26 Abbott Road, Dedham, Mass.; Major Henry Hutchings, Jr., I, 8th Engineers, Fort McIntosh, Texas; Major Daniel Noce, I, Office District Engineers, Post Office Box 97, Memphis, Tenn.; Myer Saxe, XV, Kesslen Shoe Company, 191 Lincoln Street, Boston, Mass.; Joseph C. Moosbrugger, II, Suburban Engineering Company, 15 West 38th Street, New York, N.Y.; Bruce F. Rogers, X, 709 Stuart Avenue, Mamaroneck, N.Y.; Donald J. Swift, X, Consolidated Edison Company of New York, 4 Irving Place, New York, N.Y.; Whitney H. Wetherell, II, Carrier Corporation, Chrysler Building, New York, N.Y.; J. Van H. Whipple, II, Box 139, Blue Point, Long Island, N.Y.

Since this is the last issue of *The Review* before the Yuletide season, your Secretaries take this opportunity to wish everybody a very Merry Christmas and a Happy New Year! — RAYMOND A. ST. LAURENT, *Secretary*, Rogers Paper Manufacturing Company, Manchester, Conn. CAROLE A. CLARKE, *Assistant Secretary*, 10 University Avenue, Chatham, N.J.

1922

The lack of news from the Class for the current month indicated undoubtedly that everyone was digging in for the November elections and the coming winter. Your Secretary saw Ed Ash in Detroit recently, and Ed volunteered to set an example for the rest of the Assistant Secretaries by taking over *The Review* notes for one of the forthcoming issues. Ed has financial and guiding interest in a number of enterprises, and time is at a premium, which makes his offer of assistance doubly impressive.

At the National Metal Congress in Detroit in October, the M.I.T. luncheon was attended by about 40 assorted metallurgists and engineers. Our Class was represented by E. D. Martin, L. E. Raymond, and your Secretary. — CLAYTON D. GROVER, *Secretary*, Whitehead Metal Products Company of New York, Inc., 303 West 10th Street, New York, N.Y. C. YARDLEY CHITTRICK, *Assistant Secretary*, 77 Franklin Street, Boston, Mass.

1923

Al Redway served as official photographer for the 15th reunion and produced several reels of colored movies, as well as an assortment of still pictures which, I understand, have been put on slides. Some of the reunion committee members attended a preview of these shots on

1923 *Continued*

Monday evening, October 17, and thereupon laid plans for a party at Walker on November 7, at which these were to be shown to any of the gang who could come. The party was informal, ladies were invited, dinner was served. This was the first of a number of gatherings planned for this winter, and if you are in a position to come to any of these affairs, yet live outside the district to which notices are ordinarily sent (Metropolitan Boston), let Howard Russell know of your interest. He may be reached at 60 Batterymarch Street, Boston, Mass., and he'll be glad to see that you are notified of all functions.

In the July Review I took advantage of notes sent in by many of those who responded to our announcements but expressed regret they couldn't attend the 15th reunion. I've still got quite a lot of interesting information thus collected, some more of which is passed along in the following: Red Adams is chief engineer of Massey Harris Company, at Racine, Wis. — T. G. Adams reports himself tangled up in asphalt paving, a business which he says requires 12 months' work to be turned out in eight. His concern is John McCourt Company of Boston. — E. M. Barnes, writing from Tenafly, N. J., says the reason I have seen his address change all over the map is the traveling he is required to do in connection with his work on production control, industrial costs, and such things for George S. May Company, industrial engineers. — Ray Brink has been for 12 years with the engineering department of the New Departure division, General Motors Corporation, at Bristol, Conn., and admits to being married.

Sherwood F. Brown says he's still single and in no danger but warns that this is neither a boast nor a promise. He says some of the boys should get a good laugh from the fact that he has been assistant professor of physics at St. Lawrence University, Canton, N. Y., for three years. — H. A. Dambly, since leaving Technology, has been with the Philadelphia Electric Company in general engineering activities, mostly those associated with transmission and distribution. At present he is assistant engineer of the division of special investigation and testing. He mentions that others from our Class with the company are H. S. Davis, A. H. Kidder, and J. H. Neher, all in engineering and operating work.

Frederick T. Entwistle says he likes Richmond, Va., where he now lives. He says his work is making the new product "Cordura" for Mr. Du Pont and recommends we try it in our tires. — H. B. Gray had all sorts of good resolutions about coming to the reunion. He did fine work in contacting all the '23 men in Indiana, exhorting them to come to the reunion party. Then, about a couple of weeks before, he had a chance to go on a fishing trip in Canada. Apparently the trip was a lulu: "Every time we would cast, we would hook onto a five- or six-pound trout." That is a sample of his report. Practical difficulties in getting away for a few more days for the reunion finally

kept him away. He is with the Vitreous Steel Products Company of Nappanee, Ind.

Ollie Hooper, who is with the Federal Power Commission in Washington, turned in some news: One item, that Ed Roll was working in the Securities and Exchange Commission and would help him promote the reunion among those in Washington district even though he couldn't make it himself; another, that Ed Pomykala had left the Procurement Division. — I later got some further data on Erwin G. Schoeffel, whose connection with the Aluminum Company of America was reported in a recent set of notes. He was married October, 1926, to Marjorie L. Sibley (Wellesley '23). They have two children — David Erwin, four years; Nancy Sibley, 18 months.

Frank Travers was another of the Indiana delegation who hoped to get to the reunion but for one reason or another didn't make it. He reports he has had two jobs since leaving Technology: One was at Eli Lilly and Company, pharmaceutical manufacturers in Indianapolis, where he was sales research manager; the other was with the Lincoln National Life Insurance Company at Fort Wayne, where he started as investment research manager, then became financial secretary, and is now a second vice-president in charge of a \$48,000,000 bond portfolio. He further comments that he is still a bachelor but expects to do something about it. (Don't crowd, girls!) — Preston Woodling is with Curtiss-Wright Corporation and lives in Riverside, Conn. He says the aviation industry is quite busy and that means him too. — HORATIO L. BOND, *Secretary*, 457 Washington Street, Braintree, Mass. JAMES A. PENNYPACKER, *Assistant Secretary*, 96 Monroe Road, Quincy, Mass.

1924

Of particular interest and gratification to members of the Class is the appointment of Harold L. Hazen as head of the Department of Electrical Engineering at the Institute, in which position he succeeds the new dean of engineering, Edward L. Moreland '07. — A chance meeting with George Parker early in the fall revealed that he is now associated with Johns-Manville's New York office and that he still maintains his home in Wrentham, Mass. — Subject of a feature story in the *Boston Globe* during the summer was Birger Headstrom of Medford, Mass., whose unusual hobby is the collection of insects and reptiles at his home. He has collected specimens from all parts of the United States and from most of western Europe and is also author of a book entitled, "Exploring the Insect World."

A recent letter from Bill Robinson states that Archie Carothers has recently acquired a new home near that of the Robinson family in Los Angeles, and that Royce Greatwood and Si Simonds are also frequent callers, generally armed with many hundred feet of movies taken on their trips to the Orient. Royce travels as special representative of the Union Oil

Company and Si as engineering officer for the Dollar Line on the electrically driven *Coolidge*. — Plans for the 15th reunion next spring are beginning to take shape, so be sure to arrange to attend. A most interesting event is certain. — FRANCIS A. BARRETT, *General Secretary*, 50 Oliver Street, Boston, Mass.

1925

The news this month is brief and to the point. First comes our wedding announcement section: Tom (or should we give him his full name, Dr. Thomas J.) Killian has stepped off at last. He was married on September 12 to Ilona Elizabeth Bucko of New Brunswick, N. J. The wedding took place at St. Joseph's Church in Pittsfield, Mass. The wedding trip was announced as being "a tour of England and the Continent." Your Secretary is somewhat puzzled by the geographical complications implied by the future home in New York City, the home of the bride in New Jersey, and the locale of the wedding in Pittsfield. But perhaps Tom can set us straight on that; so we'll wait until we hear from him before going into the matter any further. In the meanwhile, a few words about Tom's bride, for the benefit of his friends who may not have received direct information: Mrs. Killian is a graduate of the New Jersey College for Women, holds the degree of master of fine arts in drama from Yale, and has studied dramatics in Vienna and Budapest on an international fellowship. She has had practical experience in drama with the Connecticut Players of Milford and this year has been with the forum scenario department of Twentieth Century-Fox Pictures and the South Shore Players in Cohasset, Mass.

I am afraid I must apologize, in some sense, for not making the most of my opportunities. On October 1, I was one of the contenders on the well-known Professor Quiz radio program. The apology is for not sneaking into my words on the air some reference to my being a graduate of the M.I.T. and perhaps a request for members of the Class who may have been listening to write in and let me know that they had heard me, as well as to furnish me with material for more of these notes. Since I did not do so then, I am requesting now that all members of '25 write within the next week or two. Please do not confine yourselves merely to telling your address and business connections. These, we have to a major extent from our address file. What we want is vital statistics — that is, marriages, number and names of children (if any), and encounters with other members of the Class. In fact, if you have met any members of any M.I.T. Classes and can tell anything about them, I will gladly pass on the information to the Secretaries of their Classes, or you can write to the Secretary of the particular Class directly. I express the hope that none of you was seriously affected by the New England hurricane; if any of you have interesting observations about it, we should like to hear from you, as members of the Class in remote parts of the

1925 Continued

country — or the world, for that matter — would appreciate some firsthand information. — HOLLIS F. WARE, *General Secretary*, 17 Green Road, Medford, Mass. F. LEROY FOSTER, *Assistant Secretary*, Room 6-602, M.I.T., Cambridge, Mass.

1926

Down in the Argentine the Du Pont Company of this country and the Imperial Chemical Company of England have gone 50-50 to form the hybrid company called Duperial. On the managing board of this South American company is our own R. W. Plummer, and he called by to see the Secretary in October, being in town apparently to see the Harvard-Dartmouth game, although he did not come from South America for that purpose. Plummer started out as a metallurgist and for a number of years was with the Du Pont Company in Wilmington. Apparently he is on a permanent assignment in Buenos Aires.

The Secretary has always wanted to know someone who lives in Painted Post, N.Y. Now he has found his man: Wallace K. Newcomb, who lives at 449 Brainard Place. Had he known it existed, he would also have wanted to know someone who lives on Clocks Boulevard, Amityville, Long Island, but Dave Harrison got there first. Then there is Samuel G. Eskin, who lives in vernal splendor on Jonquil Terrace, Chicago, Ill.

Other interesting odds and ends gleaned from an almost empty folder: Laurence G. Cumming has an interesting job with the Children's Museum in Boston and is promoting radio clubs among youngsters in the metropolitan area. John S. Shaheen is the new name for Shahady Shaheen. Richard Whiting, who is in the patent law firm of Fish, Richardson and Neave, is now a member of the Alumni Council. Walter Crafts (working with one J. L. Lamont, also of Union Carbide and Carbon Research Laboratories, Inc.) presented two papers at the American Society for Metals meeting in Detroit in October: "Some Effects of Deoxidizers in Low Carbon, 1.5 per cent Chromium Steel" and "Hardenability of Low Chromium Steels." — J. RHYNE KILLIAN, JR., *General Secretary*, Room 3-219, M.I.T., Cambridge, Mass.

1929

You will recall the recent announcement of the engagement of B. Gratz Brown, II, to Miss Willette Ockendon of New York City. This month we follow with the announcement of the marriage of this fine couple. The wedding took place in New York on Saturday, October 22. Though we are not specifically informed, we assume that Gratz and Mrs. Brown will, in due course, establish a residence in Flint, Mich., or in that vicinity, for it is there that Gratz develops ideas for the A-C Spark Plug Company. Now that Brig Allen and Gratz Brown, two of the (at one time) most confirmed bachelors in the Class, have made the big step, marriage should be only a matter of course for the remaining

bachelors. Hence, we guess that the single men are going to have a hard time mustering sufficient talent to give the married men a contest in the events at our 10th reunion next summer. We join in wishing Gratz and his bride a happy and prosperous future and hope that they will be blessed with the best of health throughout a long life together.

Our only other news is gleaned from New York press clippings and announces the appointment of Robert G. Cowan, XV, as cashier of the National Newark and Essex Banking Company of Newark, N.J. Judging from the newspapers, Bob has received a B.F. degree (banking and finance) from New York University since he left the Institute. Though not engaged in engineering, he seems to be doing pretty well by himself, and we congratulate him on this excellent promotion.

What about the rest of you? What are you doing? Where are you located? That reminds me: Jo Llansó, II, sent a card, a while back, stating that he was traveling in Brazil on business and apparently still is located in Buenos Aires as his headquarters for Worthington Pump.

Do not forget to plan for our 10th reunion next summer. It is a milestone that we cannot pass without getting together. While we may be far from location at present and may feel that the gang will get along without us, the Lord only can say where we will be 10 years from now. Let's get together and renew old times while we still recognize one another. To be sure, some of us may be a bit more bald than the rest, but baldness seems to have lost its distinction as a sign of age — take it from your Secretary. Let's plan on a journey East next summer. Time and place to be announced later. Make tentative plans now, and we will all join in a rousing Technology Stein Song at our 10th reunion. — EARL W. GLEN, *General Secretary*, Box 178, Fairlawn, Ohio.

1931

The hurricane has been blamed for a lot, but few would expect to find a class secretary using it as an alibi for the non-appearance of notes in the November Review. The hurricane is my alibi, however, as I found typewriting difficult by candlelight.

From the *VI-A News* we have the following: "John V. Berger writes to say that he has two daughters now, although the last one was sick for a while after birth. Happily she pulled through and according to John is now healthy and happy. He also reports that his air-conditioning work requires less and less electrical knowledge. Except, of course, for those rare instances in which a motor burns out two weeks after the guarantee expires and he has to tell the irate customer why." — Horst Orbanowski sends an announcement of the birth of a daughter, Anita-Charlotte, at Düsseldorf-Oberkassel on June 2. — Jack Brown provides us with information concerning Buck Moody: Buck is married and living in Denver. He came East for a visit last summer with Mrs. Moody and a daughter.

Among the bachelors in the Class, I ran across Jack Brown down in Peabody, Mass., where he is working in the research and development department at the A. C. Lawrence Company. — Ben Hazeltine is with the Fiberloid Corporation at Indian Orchard, Mass.; he claims that he is working hard, but he looked just about the same old Ben to me. — Art Demars is with Jackson and Moreland, and when last seen he was busy building an addition on the Boston Edison plant in South Boston. — Fred Brooks is living in Springfield, Mass., and working for the Gates Rubber Company. Early last summer Fred went to Denver for a visit to the home of the Gates Rubber Company, a trip which he earned through being top man in the East.

The following letter was sent to The Review by Fred Nordsiek: "On April 1, I was appointed assistant in the department of nutrition of the American Institute of Baking. I am working under James A. Tobey, S.B. '16, Dr.P.H. '27, who is the director of the department. For the present I am retaining, on a part-time basis, my appointment as executive secretary of the New York Diabetes Association. I have administered the Diabetes Association since February, 1935. My most recent publication was 'The Story of Insulin' in the October, 1937, issue of the *Diabetic Journal*, London, England."

Weddings of the past summer included that of James B. Fisk, former Class Secretary, and Miss Cynthia Hoar, daughter of Mr. and Mrs. Samuel Hoar of Concord, Mass. Jim and Mrs. Fisk spent the summer in Germany and are now at home in Cambridge. — Lawrence B. Barnard married Miss Janet Porter Boomer of Waterbury, Conn. — William B. Cutter's wedding to Miss Helen Gillham Smiley of Louisville, Ky., took place at "The Cedars," the Smiley family estate at Middlebrook, Va. — At Reading, Mass., Miss Phoebe Frances Mercer became the bride of Gordon Lee Colquhoun. Mr. and Mrs. Colquhoun are at home on Summer Street, Andover, Mass. — Miss Dorothy Myrtle Kuhn became the bride of Gordon D. Shellard at Ridgewood, N.J. Following a trip to the Canadian Rockies the couple are making their home in Ridgewood. — Miss Laura M. Spinelli was married to Vincent F. J. Damiano in Somerville, Mass. Mr. and Mrs. Damiano are to live in Townsend, Mass. — BENJAMIN W. STEVERMAN, *General Secretary*, 11 Glenland Road, Chestnut Hill, Mass.

1932

Obie Denison '11 has kindly sent the Assistant Secretary the following notice from the Worcester *Evening Gazette* of October 20: "Dr. and Mrs. Oscar T. Marzke of 515 Grove Street, announce the birth of a son, Robert Franklin Marzke, yesterday in Memorial Hospital. Mrs. Marzke is the former Roxana Holden of Newton, daughter of the late Mr. and Mrs. Adam P. Holden. Dr. Marzke is the son of Mr. and Mrs. Otto C. Marzke of Lansing, Mich." — Congratulations!

1932 Continued

Very few items of class interest have come across the desk of the Assistant Secretary in recent months. After two and a half years in the depths of northern Pennsylvania, Bill Spreen sold his "emporium" in Emporium and retired from the presidency of the Emporium Chamber of Commerce, at least temporarily. Professor Shaefer's business law course was fine so far as it went, but Bill had found that this is a rough and nasty world and a heavy coating of legal armor would be of great assistance. Hence Bill has entered Columbia Law School. — I understand that our honorable Secretary has moved up in the Pathé organization and now holds down (!) a post in their New York office. After several years of effort I finally got to Bound Brook a few weeks ago with every expectation of having the pleasure of meeting Mrs. Chase and, incidentally, of seeing Chippy — when lo — I found he had moved to New York. — CLARENCE M. CHASE, JR., *General Secretary*, 3705 79th Street, Jackson Heights, Long Island, N.Y. CARROLL L. WILSON, *Assistant Secretary*, Research Corporation, 137 Newbury Street, Boston, Mass.

1933

The news is a little bit on the weak side this month, being written near the end of October when we are just starting the fall swing. In another month or so we shall be more in the spirit of writing some letters. However, we have announcements of the weddings of some of the confirmed bachelors in the Class, which surely will be interesting news. We have the marriage of Henry E. Kiley to Miss Mary E. Killion on August 31 at Medford, Mass. They plan to live at 9 Dana Street, Cambridge. Kiley is now an instructor at the Institute. — The wedding of David R. Treadwell and Miss Sarah H. Kenniston took place at the Union Theological Seminary in New York City. The Treadwells plan to live at 241 West 12th Street, New York City. Treadwell, as you know, is now working with the E. I. du Pont de Nemours and Company in the plastics division. — The marriage of Emerson Shapleigh Norris to Miss Christine Margaret Martin occurred at Mansfield on Saturday, October 1. Norris, as most of you probably know, is with Revere Copper and Brass and is doing very nicely. The Norrises expect to live at 11 Lafayette Street, Fairhaven, Mass. — The wedding of Kennedy Holm Clark and Toska Ann Borries was celebrated on October 11 at Louisville, Ky. I am sure we send all these folks best wishes for many happy years to come.

There are two items in the *VI-A News* of September about our Class: "John Sloat, '33, has informed us that he was consulting geophysicist for the Union Oil Company of California last year. Quoting his letter, 'It was my good fortune to map by modern geophysical methods what has since become the deepest producing oil field in the world, at Rio Bravo, California. At present there are ten of the world's most expensive oil derricks exploring this superdeep struc-

ture. The oil is of high gravity — such that the original well, costing \$260,000, paid for itself in a few months after completion. This is a clear-cut case of the success of modern geophysics.'"

"Doctor Norman Levinson, also of '33, now of the Department of Mathematics at the Institute, has recently been asked to write a book for a Colloquium Series of the American Mathematical Society, and has also been invited to become Associate Editor of the *Duke Mathematical Journal*. After graduating from the General Electric Option of VI-A in 1933 he was sent to Cambridge University on a fellowship to study mathematical analysis under Professor G. H. Hardy, who is considered one of the world's leading authorities on mathematical analysis. Professor Hardy once said that Dr. Levinson would soon be recognized as such an authority, and those predictions are materializing rapidly. From Cambridge where he studied a year, Doctor Levinson went to Princeton and did research for a year and a half, and then he became an instructor in the math department here last year."

Joe Wetherell just stopped in the office as this is being written and told us that Bruno Sbraga was married this month (October). — Also, we have heard that Jim Turner is now with Talon, Inc., at Meadville, Pa. Lots of luck! — That's all for this time, and don't forget my address. — GEORGE HENNING, JR., *General Secretary*, Belmont Smelting and Refining Works, Inc., 330 Belmont Avenue, Brooklyn, N.Y. ROBERT M. KIMBALL, *Assistant Secretary*, Room 3-102, M.I.T., Cambridge, Mass.

1934

The previous report that Bob Moody is now stationed in Germany was substantiated recently by an interesting letter postmarked Wiesbaden, Germany. Instead of trying to paraphrase what he has to say, I shall quote the whole letter verbatim: "A few weeks ago I received both the June and July issues of *The Review* and, after reading your closing paragraph in the class notes for June, I decided it was high time I sat down and dropped you a line. Really, so much water has gone over the dam since I last wrote that I hardly know where to begin. You will perhaps remember that I was transferred from the New York to the Detroit office of the export division of General Motors about a year ago. Well, I stayed in Detroit just about five months and then was sent over here to Germany for further training. Here, I am connected with Adam Opel, a/G., General Motors' German operation and the manufacturer of Opel passenger cars and Blitz trucks. I am going through a course of training in every department in the plant. I have spent two months in the production department, a month in the inspection department, and several weeks in the engineering department. Within the next few months I expect to spend time in all the other departments, such as supply, sales, parts, finance, export, and so on. It is some job in a plant of this size, em-

ploying 26,000 men, trying to get a general idea how every department works, but mighty interesting.

"I expect to be here until sometime in the spring. For the last six months I am supposed to specialize and at the present time, it looks like production work. Just whether I will return to the States at the end of that time or whether I will be transferred to another plant is hard to say. That, however, is one of the joys of this exporting game; you never know what's coming next. Of course, being over here does have some disadvantages. The chief one is that you never run into any of your old Tech friends. I suppose there are a few around Europe here some place, but I sure don't know where they are.

"Although I have been keeping my nose pretty well to the grindstone in Rüsselsheim ever since I landed in March, I have managed to take a few trips and see a little of the country. Over Easter, I took a run down to Switzerland and had a look at Lake Lucerne and the Alps. Even went up the Jungfrau and saw the sunrise. Sure was beautiful! Early in June, I took a trip down the Rhine as far as Cologne and then went on to Holland by train. Spent a lot of time around Amsterdam and the surrounding country. Finally, a few weeks ago, I ran over to France for a little ocean swimming. I don't know, but I have always lived not far from the sea and I sure miss it when I can't jump in at least a few times during the summer.

"I suppose we are going to have our fifth reunion next June. I hope I can be home for it, but God only knows. Drop me a line sometime and let me know how things are going at home. Also, please pass the word on to any of the fellows, that if any of them get over this way and don't look me up, I am sure going to feel bad about it."

In the May, 1938, issue of *Excavating Engineer* is an interesting illustrated article on the clay operations at Gleason, Tenn., of the Bell Clay Company, of which Dick Bell, our President, is general manager. This article features especially a combination scraper and bulldozer which is apparently a new piece of apparatus developed by Dick to make material reduction in the cost of handling his waste material. Incidentally, Mr. and Mrs. Richard Bell announced the arrival of Linda Claire Bell on April 29. Our heartiest congratulations!

John W. Alder, who found himself unemployed during the winter and spring, put in his time at home in Minneapolis by attending the University of Minnesota. He was taking courses in geology and in ore dressing, including special laboratory work in thin sections and oil immersion in geology and the flotation of quartz in the laboratory. However, the first of May he secured a job as engineer for a dredging operation by Porter Brothers Corporation at Granite, Ore. — A doctor of philosophy award has been given to John Coryell Turnbull. His thesis was "The Inelastic Scattering and Diffraction of Slow Electrons from a Silver Single Crystal."

1934 Continued

Through the summer there has accumulated an interesting list of engagement and wedding announcements. Some of the weddings have been previously announced as engagements. We have a confirmation on the report of Frankie Baxter's wedding which was given in the last issue. Here are the details: Saturday, August 27, was the great day for Frankie. The ceremony took place at four o'clock in the home of the parents of the bride, Miss Mary Noble Perkins. By this time you will find Mr. and Mrs. W. Franklin Baxter, Jr., at home at 12 Princeton Street, Worcester, Mass. Happy sailing! — From out Chicago way come an announcement of Ed Geittmann's fatal step. On Friday, the 14th of October, Mr. and Mrs. Robert Dixson Baird of Evanston, Ill., announced the marriage of their daughter, Mary Dixson, to Mr. Edwin John Geittmann. Mr. and Mrs. Geittmann will be at home sometime in the very near future. The address: 7695 Rogers Avenue, Chicago. Congratulations!

The following announcements may be old news to some, but here goes: On May 14, Wendell Olmstead Wright took unto himself a bride. Mrs. Wright, who was Marie Dorothy Sholz, is the daughter of Mr. and Mrs. Anton Sholz of Gardner. The ceremony was performed at four-thirty in St. Paul's Episcopal Church, following which the couple left for a wedding trip through the Shenandoah Valley prior to making their home in Chicago. — George Brewster became a married man this last spring. He was married to Miss Joan Ryerson, daughter of Mrs. Donald M. Ryerson of Lake Forest, Ill., on May 28. Mr. and Mrs. Brewster spent their honeymoon in Bermuda and are now living in or near Boston. — On Friday, May 27, Arthur Hansen was married to Miss Rachel Brownville. Mr. and Mrs. Hansen are residing at 86 Browne Street, in Brookline, Mass. — Another June wedding was that of Miss Dorothy Ruth Mahoney to Samuel W. Joel. Dr. Joel took his bride to Bermuda for a wedding trip following the ceremony on Friday, June 17. Mrs. Joel is the daughter of Mr. and Mrs. Robert Vincent Mahoney of Belmont, Mass., and a graduate of the Bryant and Stratton School. Sam received his M.D. from the Tufts Medical School. — Here's another Belmont wedding which took place on Saturday, July 2. Jacob Jaeger was the happy bridegroom and Miss Anne Mason the bride. Miss Mason, or rather, Mrs. Jaeger, is the daughter of Mr. and Mrs. Hiram W. Mason of Belmont. The ceremony took place at the bride's home. The couple are now at home on Craigie Street, Cambridge.

I have here the announcements of both the engagement and the wedding of David C. Scott, Jr., to Miss Helen Safford Bonnell, daughter of Mrs. Henry Houston Bonnell and the late Mr. Bonnell of Chestnut Hill, Pa. Both announcements were made from London, England. The wedding took place in St. Martin-in-the-Fields on Tuesday, August 23.

Following a trip in England, Mr. and Mrs. Scott returned to America to make their home in Providence, R.I. — Engagements announced during the summer season include that of: Robert Castle to Miss Lois May Smith, daughter of Mr. and Mrs. Clifford A. Smith of Dedham, Mass.; that of Aaron Keever Redcay to Miss Phyllis Marie Needham '36, daughter of Mr. and Mrs. Wylder Linwood Needham of Boston (they are planning a December wedding); and that of John Hitchcock to Miss Doris Gilbert, daughter of Mr. and Mrs. Royce Wheeler Gilbert of Chestnut Hill, Mass. — JOHN G. CALLAN, JR., *General Secretary*, 184 Ames Street, Sharon, Mass. ROBERT C. BECKER, *Assistant Secretary*, South American Development Company, Apartado 655, Guayaquil, Ecuador, S.A.

COURSE X

Lou Holladay is living at the Y.M.C.A. in Westfield, N.J., and is working for Du Pont at Grasselli, N.J., where he is an industrial engineer. Last seen sporting a new car, he seems to have solved the problem of prosperity. Ted Kresser is still working for the Fiberloid Corporation in Springfield, Mass., and sent pictures of his delightful summer cottage. Johnny Holden, when last heard from, was instructing at McGill University and sailing boats and studying for his doctorate in the summers. Sam Rulon is living at 501 Gay Street in Phoenixville, Pa., and is doing research for a company near Morristown, whose name, to my eternal disgrace, I have forgotten.

Your Course Secretary is busily working in New York, principally grinding out calculations for the oil business and gratefully accepting such tidbits of information as come his way. — HERBERT W. ANDREWS, *Secretary*, The De Florez Engineering Company, Room 1906, 19 Rector Street, New York, N.Y.

1935

For the first time since we were graduated, these notes will not carry any news of the Class. However, I believe that all of you will feel that the class survey which has been published will more than make up for the absence of news in this column. There are a few of you who will not receive the class survey. The questionnaire which was mailed out contained the statement that the results of the class survey would be mailed only to those fellows who replied to the questionnaire. Any of you who did not receive the survey because you neglected to send in your answers to the questionnaire can get a copy (as long as the supply lasts) by writing to me and giving the following information: (1) a statement of whether or not you wish to remain a member of the Class; (2) your present mailing address; (3) the name of the company for whom you work; (4) the position which you hold within that company; (5) the type of work which that position calls upon you to perform; (6) if married, the date of marriage and wife's maiden name, and names and dates of birth of any children; (7) an answer to the following

question: "Would you be willing to gather news about a group of classmates of your own choice and send it to me regularly?"; (8) any other news about yourself or classmates that you may have at the moment.

The incentive for sending in the foregoing information is this: The class survey gives such information for about 500 members of the Class. This is your opportunity to find out just what all your friends are doing and where they are. Don't fumble the ball, as this is the last chance. — ROBERT J. GRANBERG, *Secretary*, Central Y.M.C.A., 100 Gibbs Street, Rochester, N.Y. RICHARD LAWRENCE, *Assistant Secretary*, 111 Waban Hill Road North, Chestnut Hill, Mass.

1936

Members of our Class are scattered all over the world, and occasionally we hear from one of our group in a foreign land. For example, I have at hand a letter written last July from the Foreign Y.M.C.A. in Shanghai, China; the author — none other than Win Stiles, XV. He writes: "As you know, I joined the Texas Company the day after graduation and was promptly sent to Port Arthur, Texas, for a training period of 12 months. Was duly taken off that in May, 1937, and assigned to the Texaco test fleet in the capacity of test engineer for five months. We covered every state in the Union and over 25,000 miles in an exhaustive test of Texaco lubricants. By the end of that trip, I had about decided that I'd had quite enough traveling. Word soon came through that I was to report to the New York office for further training. Spent two months there under the watchful eyes of the big shots, but guess I didn't make such a good impression, for they decided to farm me out to China. In due course, I bade a fond farewell to Boston and raced back across the country to catch the S.S. *President Coolidge* for Honolulu, Yokohama, Kobe, and Hong Kong. Sailed on December 10 from 'Frisco, after having been properly 'poured' on board by several friends. It was a most enjoyable respite to relax and live the life of a king for just one month until we reached Hong Kong. Spent a very 'wet' New Year's Eve at the American Club there and sailed the next day for Shanghai, arriving on January 10.

"My first assignment was operation work at our terminal about 12 miles downstream on the Whangpoo River so I again moved, bag and baggage. Finally lighted in one spot for the first time in about eight months and assumed duties as maintenance foreman over 59 Chinese fitters, carpenters, masons, and coolies. My work covered 19 acres of property and equipment which was in a sad state of repair. You can imagine that it was a discouraging aspect, especially since the labor force had become lazy during the war. By physical, financial, and moral persuasion I finally managed to get something done after five months there. It was indeed an experience to supervise everything from planting a vegetable garden to erecting a brick building. The first of

1936 Continued

May, I was again transferred to the head office of the China district in Shanghai to assume a white-collar job as marketing assistant. At present there are two of us establishing all prices and marketing policies for the company from Singapore to Dairen, Manchuria. It really means a world of work and experience. Sometimes I wonder how our 12 districts can write so many letters or ask so many foolish questions.

"At the present time it appears that I may soon be transferred again — this time to Yunnanfu. This latter town is about eight hours by plane from Hong Kong directly west, thereby placing it close to the border of Tibet and Burma. They tell me the climate is excellent, but very few white men have ever penetrated that far. It looks interesting! Am sorry to say that I can't give much information on actual conditions here, since a rigid censorship obtains. Suffice it to say that American business is almost nil and whatever markets we had ever built up over 50 years of hard work have been annihilated. I have seen many things that, heretofore, I believed to be impossible in the world which we Americans know. In fact, many things I wouldn't mention at home because people would think me crazy. By the way, one of my very close friends here in Shanghai is George A. Flynn '28, XV, now in the capacity of district manager for Shanghai. Guess that's all the news for now. I read *The Review* religiously, am intensely interested in all the Class of '36, and would be glad to hear from them at any time." — Never a dull moment for Win, it's easy to see that! Let's hear from you again soon.

Al Horton, who sent along the foregoing letter from Win Stiles, raves about summering amidst the many lakes of northern Wisconsin. He spent last August among the "whispering pines and shiny birches" of Lake St. Croix. Concerning class news, he says: "The news of *The Class* has been skimpy lately. Henry Cargen, I see occasionally. He's still the same, of course, having a great time with Pedlar and Ryan (advertising) and doing nicely. Johnny Austin was up in the spring (you see how recent our news is) and afforded me a pleasant visit. It was a special treat to have Carol all to myself for lunch." And that's all from Al, except that he is so busy he doesn't have time to "go acourting," so we don't have to worry along that line!

At last we have some news about the whereabouts of Bill Benson, XVI. He reports: "I entered the Daniel Guggenheim Graduate School of Aeronautics at Stanford University in September, 1936, and completed the course there last June to receive the degree of aeronautical engineer. During my last year, I was elected to the Stanford chapter of Sigma Xi, and have submitted my engineer's thesis to the National Advisory Committee for Aeronautics for publication as a technical note. I am now employed on a student engineering program at Douglas Aircraft Company here in Santa Monica. This training is to last about 16 months. . . ."

Now before going on to our engagements and marriages column, I want to quote the *VI-A News*: "Martin Gilman again crashes the pages of the *General Radio Experimenter* — this time with a development on shielded connectors for AC measurements. The purpose of these shielded cables is to eliminate capacitive pick-up in measuring circuits, especially audio- and radio-frequency bridges." It appears that Mart is doing very well with *General Radio*. — From the pages of *The Tech* we read that Ross McKeever is at the Institute with the School of Architecture. The architects have a beautiful new library in Building 7 (members of our Class will rack their brains to try to remember where that is — it's the new building on Mass Avenue), and McKeever is the assistant librarian in city planning and housing. — Kay Shott, VII, is employed by the American Sugar Refining Company in Boston. — Finally, we hear that Bob Williams, VI-A, was recently awarded first prize in the annual General Electric Student Engineering Technical Paper Competition. The award was made at the Schenectady session of the American Institution of Electrical Engineers. The title of the paper was "The Historical Investigation of the Diesel Engine."

Heading our weddings and engagements section is the announcement of the engagement of Phyl Needham to Aaron Redcay '34, X. The wedding will take place in the chapel of the Old South Church on December 26. The young couple will then join the M.I.T. colony in Baton Rouge, La. — The wedding of Malcolm Seymour and Miss Mary Wilson occurred as scheduled last May 20 in Cohasset, Mass. The newlyweds had a wedding trip to Bermuda. — September 26 saw the wedding of John Beattie and Miss Alice Ashley of Cambridge, a Radcliffe graduate. After a wedding trip to Canada, they are living in Andover. — Marshall Holcombe, IX-B, plans to marry next spring. His fiancée is Miss Vivian Swaine of New York City, a graduate of Wellesley in 1937. Marshall is connected with the United States Patent Office in Washington, and he is also studying patent law. He spent a year at Harvard Law School after leaving M.I.T. — Finally, we hear about George Pearson, who was with us our freshman year. He is planning to marry Miss Ruth Osborn of New York City.

They say that "no news is good news," but not so for a contributor to the class notes. It isn't necessary to have had experiences like Win Stiles; we're interested in whatever you're doing. Write to your Course Secretaries, most of whose names and addresses were given last month, or write directly to Al Horton or me at the addresses below. — ANTON E. HITTL, *General Secretary*, 491 Ashland Avenue, Buffalo, N.Y. ALLEN W. HORTON, JR., *Assistant Secretary*, Room 3-210, M.I.T., Cambridge, Mass.

1938

The Class is at long last making its initial appearance in *The Review*, but any news must come from you fellows who,

according to our files, are scattered just about everywhere. In order to facilitate the gathering of this news, we are arranging to have course secretaries who will act as clearing houses for any information you may send them. However, in the meantime, do not hesitate to drop a line to the Secretary or the Assistant Secretary, for they (the Assistant Secretary, particularly) would be overjoyed to hear from you.

Plunging our hands into the mailbag, we come first to engagement notices of interest: The Daniel Poors of Peabody, Mass., announce the engagement of their daughter, Helen, to John Charles Kinnear, Jr., one of our Alumni with the Nevada Consolidated Copper Company. — Mrs. Frank Day Walden's daughter, Hope, of Newton will wed Thomas R. Taylor, Jr. — Marriage notices claim our attention next: We find the *VI-A News* with the report that Alfred Kilgour has succumbed to one of Cupid's fateful darts. Alf was married to Miss Evelyn Randall on June 27 at Albion, Mich. Since Alf was the special news editor of the last *VI-A News* staff, the present incumbent of this editorial position obviously has something to shoot for. — Paul J. Shirley, X, has also left the bachelor ranks. We have before us the announcement of his marriage to Miss Joanne Sargent of Brookline. Paul is with Penick and Ford in New York City. — The wedding of Will Roper, XV, was in the nature of a reunion for many of his classmates. Will marched altarward with Miss Dorothy Bissell of Waban, Mass. — Earlier in the summer we received the announcement of the marriage of Jack W. Roe, lieutenant in the United States Navy, who was graduated from the Course in Naval Construction. Miss Frances Merriam Logan of Cambridge is now Mrs. Jack W. Roe. — About the same time we read of the marriage of Miss Cornelia Hunt of Portland, Maine, to Wadsworth Hinds. Congratulations, men!

From Jack Wallace, our erstwhile President, we hear: "Pan American seems to be the ideal employer. I'm having a lot of fun working on madhouse ideas that various people (self included) have as a matter of course. All pertain to getting flying boats (safely) between two points with a minimum of gas and a maximum of cargo. Everything is informal and unsettled, as we're making preparations to receive the new Boeing boats sometime in the fall, we hope. Airplane delivery time is a thoroughly independent variable."

Here is a letter from Frank Kearny, II: "I spent most of this summer in the 'old country' traveling around the Scandinavian countries, having a pretty swell time. I did my best to cultivate a Swedish accent but to no avail. I did, however, have a very good view of the sun at midnight. . . . By way of contrast I also had a pretty good glimpse of Russia and the Soviet Government in general. Of course you think you see a lot, when in reality you see nothing. Nevertheless, it was extremely interesting and well worth the hardships. As for

1938 *Continued*

Paris, the less said about that the better, but whatever stories you might have heard about it I think I can verify. Adam was along on the trip also, and whatever one of us missed, the other saw."

Fred Kolb has done a fine job of shaking the bushes for news. Here is what he reports: "Now for some stuff for *The Review*. Yesterday I was crossing George Street when I bumped into Fred Du Bois. I chatted for a while and invited him to have a haircut and lunch with me. On the way to the barbershop, Fred had a phone call to make and found out that he now has a job with United States Rubber in Passaic, N.J. That's the plant making rubber specialties. He is starting off in the testing materials lab. Fred has been in the East here for several weeks, being interviewed in Washington, Baltimore, Philadelphia, New York, and points east. You may know that Fred, Louis Hull, and Brownie Parker '39, made a trip West this summer. They went out in *Nellie* — a 1929 Packard touring car, fitted up to burn either gas or kerosene (six cents a gallon!). They were gone three months and didn't sleep in a bed all that time. The boys went out through St. Louis (Fred's home) and got out around the Middle West, where they panned gold for a week or so. No luck, though, because the high water covered all the richer deposits. But they hobbled with the old Klondike prospectors and got stuffed full of winter-evening stories. They passed the Yellowstone and stopped awhile to climb all around the mountains. O yes, *Nellie* climbed Pike's Peak on kerosene! The boys climbed Mount Whitney — the highest peak in the United States. They hit out to the Coast, played around in the Sierra Nevadas, picked peaches, and . . . distributed lady bugs on a Californian fruit farm. Finally came back through Death Valley at high noon in the latter part of August! Stopped at Grand Canyon and hit the East early in September. No richer but lots wiser!

"Fred told me some news of a few other boys. Jack Wallace is doing finely down Baltimore way. At present he's designing a seaplane dock for the Pan American boats — and Fred says Jack hasn't seen a plane for months! Jack just moved into a new apartment with a couple of other '38 men in Baltimore (I don't know the names). — Barney Mehren and Louis Hull are rooming together in a new apartment in Philadelphia. They are very anxious to make a trip north to Boston and the Dorms because they're 'fresh out' of sheets and towels! Barney is working for Crown Can Company — designing new waxes and stuff for beer cans. Right now he is working on cans for watermelon juice. Louis is working for F. J. Stokes Machine Company in Philadelphia. While Barney is in the research department, Louis has the run of the plant. His company makes pumps, presses, and lots of specialty machinery, like pill presses for aspirin. — Carle McEvoy has left Cities Service in Quincy and is now out in Chicago working for some steel company. Then some time ago

we visited Esso here in Bayway [Linden, N.J.] and saw Oliver Kangas and Chuck Jahng. They're both working for Standard Oil Development Company. Oli is in the lab, having loads of fun studying polymerization of gases. He's already on his way to being a big shot and has one-half a desk, one-half a phone, and two men working under him. Chuck is up in the department which correlates the lab data and recommends their application or extension. Chuck is doing well, too. He has two push buttons — one for a male secretary and one for a female secretary. One of these buttons is worn much more than the other! Chuck and Oli are living in an apartment in Elizabeth, N.J.

"Frank Amos Knight, I hear, is working in Bangor — Eastern Paper Mills, I think. — King Coombs started work this Monday with a civil engineering construction company in Red Bank, N.J. He has just come down from Maine, where he experienced the thrills of a hurricane. King's job is a bit of advice to all job seekers. This company saw his name in the *Epsilon Journal* (civil engineering, honorary), wrote him to come down for an interview, and gave him the job! King was 'down Maine' when the hurricane hit, and spent a night with the trees crashing round, the barn roof flying off, and the wind and rain howling all over."

The college press service of the General Electric Company reports: "Shepard Roberts, studying for a B.S. at M.I.T., was one of nine students selected this month from 28 applicants from universities and colleges throughout the country to receive the assistance of Charles A. Coffin Fellowships in carrying on advanced scientific research during the coming college year. Roberts will investigate the properties of vacuum tube amplifiers having combined positive and negative feedback." — Ken Gunkel, II, who is working with Babcock and Wilcox, wrote a very newsy letter: "I am out on the road now watching boilers being erected and expect to be here until November 19, when I am recalled to Akron. The job I am 'working' on is at the Cook County Hospital and, as it is a union labor job, I can't do anything except stand around and watch, which gets . . . tiresome after eight hours. John Summerfield, Delta Tau Delta, is working here in Chicago for the Automatic Electric Company. From him I hear that Dave Wright is dispatching ships for Standard Oil Company and is much intrigued with the beauties (scenic) of Bayonne, N.J. Also, Ed Hadley is working for Bell Labs, trying to devise a method of splicing brass-covered cable or something like that. Two of my business colleagues ran into Herb Wiley at an Akron bar on a Saturday evening and said Herb was the life of the party. Herb is working for Goodyear Tire and Rubber Company and just now is somewhere in Michigan, but I can't say where. Walter Kaufman, I understand, is working for Wickwire Spencer Corporation."

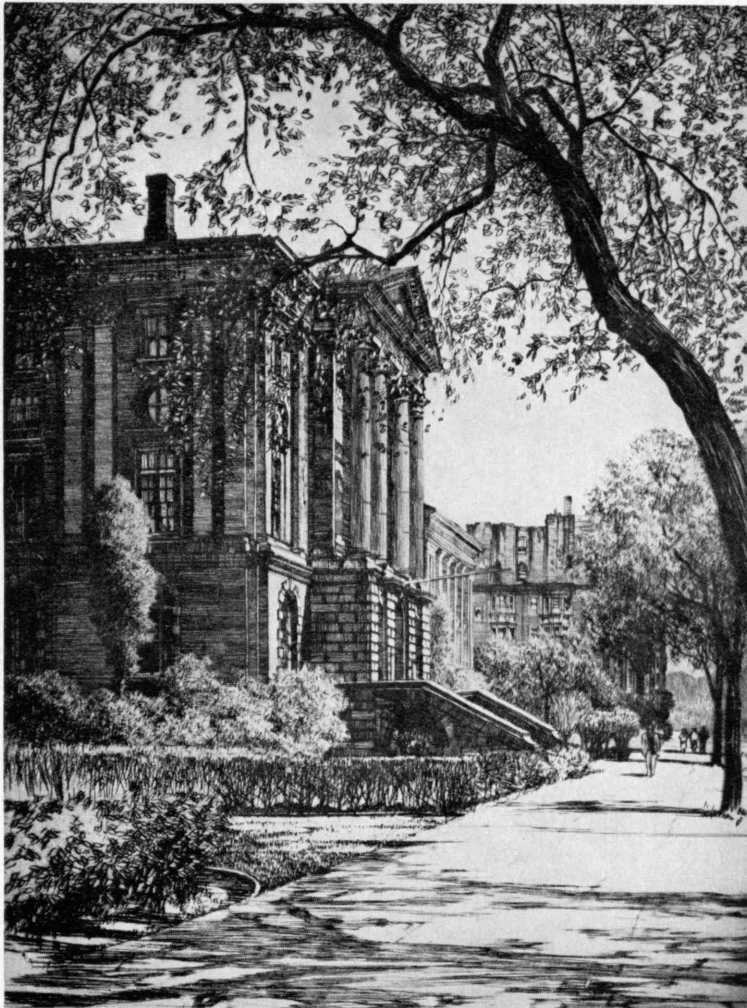
Your Class Secretary managed to write: "In the line of news, all the Betas, except Muther, are either going to school again

or are still looking for jobs — except, again, Don Weir, who is working for Eastman in Rochester. He is just whiling away the time until he can get married."

The prize catch of all, this month, is a letter from Dick Muther, the Technology Christian Association's Tech-in-Turkey representative, who wrote a long and very fascinating letter, of which we can print only excerpts: "We had a fine crossing, no rain and no rough weather, and a crowd just large enough to have a good time without being cramped. We touched at Cherbourg and Southampton and then went on to Bremerhaven, where we landed early on September 6. I had brought my motorcycle with me on the boat, so that after getting my registration and tending to customs, I rode on to Bremen. My trunk I shipped by boat to Istanbul and as yet it hasn't arrived. The Tirol and Bavaria were to me the high lights of the trip. I stopped at Garmisch-Partenkirchen for some time and then crossed a high range, which was formerly the Austrian border, to Innsbruck. In Venice I met another young teacher going out to Robert College, and he showed me a great deal of the city, himself being well acquainted in Italy. We ended up the evening with a gondola ride on the Grand Canal by moonlight. The next afternoon we entered the Dardanelles. The shores are a light brown, sandy soil, covered irregularly with scrub pine and bushes. It is very similar to the Greek shore along the Gulf of Corinth, except that here the uplands are flat rather than hilly. We landed in Istanbul the next morning and went right out to the college. It is located about five miles from the city in the suburb of Bebek and stands on a high bluff overlooking the Bosphorus, which at this point is at its narrowest. . . . My work to date has been largely assisting in the machine drawing and mechanical labs, correcting reports and problems and doing any other work they feel like handing me."

Last minute bits: Sam Steere, XV, is working with Jack Cook, II, at the Cornish Wire Company. Cookie is in Paterson, N.J., and Sam is out in Williamstown, Mass. — Bill Burrall, VI-C, and Jack Summerfield are making telephone equipment with the Automatic Electric Company in Chicago, Ill. — Harry Hollander, V, is selling machine-made dresses at Filene's. He is living with Walter Blake '37, the soap king, and Doug Esperson, who is back in Graduate School.

At the time these notes were due in the office of *The Review*, your Assistant Secretary, who has been invested with the responsibility of getting the material to *The Review* each month, was laid up. Thanks are therefore due this month to Robert L. Johnson whose splendid cooperation made our appearance in these columns possible. Johnson has a job on the financial end of the Boston Manufacturers Mutual Fire Insurance Company. — DALE F. MORGAN, *General Secretary*, 6 Avon Road, New Rochelle, N.Y. LLOYD BERGESON, *Assistant Secretary*, 885 Beacon Street, Newton Centre, Mass.



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